

# DOCUMENT RESUME

ED 209 490

CE 030 514

**AUTHOR** Herd, Amon  
**TITLE** Carpentry. Vocational Preparation Curriculum.  
**INSTITUTION** Missouri Univ., Columbia. Instructional Materials Lab.  
**SPONS AGENCY** Missouri State Dept. of Elementary and Secondary Education, Jefferson City.  
**REPORT NO** SN-10-S  
**PUB DATE** Jun 81  
**NOTE** 128p.; For related documents see CE 030 515-516, ED 195 809, ED 203 137, and ED 203 143.  
**AVAILABLE FROM** Instructional Materials Laboratory, University of Missouri-Columbia, 10 Industrial Education Bldg., Columbia MO 65201 (\$6.00).  
**EDRS PRICE** MF01 Plus Postage. PC Not Available from EDRS.  
**DESCRIPTORS** Autoinstructional Aids; Behavioral Objectives; \*Carpentry; Curriculum Guides; Equipment Utilization; Hand Tools; Job Skills; Learning Activities; \*Learning Modules; Measurement Equipment; Pacing; \*Safety; Secondary Education; Self Evaluation (Individuals); Trade and Industrial Education  
**IDENTIFIERS** Missouri

## ABSTRACT

Intended for instructors serving the occupational needs of disadvantaged and handicapped students, this curriculum guide contains nine units for a carpentry program. Its purposes are to provide minimum skills for students entering the mainstream, supplement vocational skills of students already mainstreamed, and provide vocational instructional materials for the modified classroom. Teachers should adapt these self-paced and self-contained instructional materials to suit teaching/learning situations. These nine units are included: Job Opportunities in Carpentry, Reading and Measuring with Rulers, Lumber Selection and Measurement, Cutting with Hand Saws, Uses of Nails and Hammers, Using a Hand Plane, and Using a Wood Chisel. Each unit contains these sections: (1) unit objectives and self-assessment statements; (2) introduction (motivational statement); (3) description of tools, materials, and equipment; (4) steps of procedure (explanation and illustration of given skill); and (5) student evaluation (true-false, identification, or steps of procedure). (YLB)

\*\*\*\*\*  
 \* Reproductions supplied by EDRS are the best that can be made \*  
 \* from the original document. \*  
 \*\*\*\*\*

SN-10-S

ED209490

# Vocational Preparation Curriculum



## Carpentry

Written by: Amon Herd

U.S. DEPARTMENT OF EDUCATION  
NATIONAL INSTITUTE OF EDUCATION  
EDUCATIONAL RESOURCES INFORMATION  
CENTER (ERIC)

✓ This document has been reproduced as  
received from the person or organization  
originating it.  
Minor changes have been made to improve  
reproduction quality.

• Points of view or opinions stated in this docu-  
ment are those of the person or organization  
and do not necessarily represent those of NIE  
position or policy.

PRACTICAL ARTS  
AND  
VOCATIONAL TECHNICAL  
EDUCATION

**IMI**  
INSTRUCTIONAL MATERIALS LABORATORY  
UNIVERSITY OF MISSOURI-COLUMBIA

"PERMISSION TO REPRODUCE THIS  
MATERIAL IN MICROFICHE ONLY  
HAS BEEN GRANTED BY

*Joyce Sawatzky*

TO THE EDUCATIONAL RESOURCES  
INFORMATION CENTER (ERIC)."

CE030514

# Vocational Preparation Curriculum CARPENTRY

## Table of Contents

|                              |     |
|------------------------------|-----|
| Preface.....                 | iii |
| Acknowledgments .....        | v   |
| Notes to the Instructor..... | vii |

## Carpentry Units

|                                         |        |
|-----------------------------------------|--------|
| Job Opportunities in Carpentry.....     | Unit 1 |
| Safety Rules in Carpentry.....          | Unit 2 |
| Basic Hand Tools Used in Carpentry..... | Unit 3 |
| Reading and Measuring with Rulers.....  | Unit 4 |
| Lumber Selection and Measurement.....   | Unit 5 |
| Cutting With Handsaws.....              | Unit 6 |
| Uses of Nails and Hammers.....          | Unit 7 |
| Using a Hand Plane.....                 | Unit 8 |
| Using a Wood Chisel.....                | Unit 9 |

© The Curators of the University of Missouri

1981

All Rights Reserved

Produced by the Instructional Materials Laboratory  
University of Missouri-Columbia  
Columbia, Missouri

June 1981

Catalog Number SN-10-S

# Vocational Preparation Curriculum CARPENTRY

## Preface

This Vocational Preparation Curriculum guide is a Special Needs project sponsored by the Missouri Department of Elementary and Secondary Education. The purpose of this curriculum guide is threefold:

1. to provide minimum skills for disadvantaged and handicapped students entering the mainstream
2. to supplement vocational skills of those students already in a regular training program (mainstream)
3. to provide vocational instructional materials for the modified classroom

This guide is intended to be a workable guide for instructors serving the occupational needs of various categories of Disadvantaged and Handicapped students.

Nine units of self-paced and self-contained instructional materials are contained within this curriculum. Units are illustrated and simplified to more easily aid the student in class activities or on an individual basis.

Each unit within the curriculum is color coded to represent a separate section within the unit, the color coding is explained as follows:

**White:** Objective and Student Assessment - This sheet presents the unit objectives. The student must meet these objectives to successfully complete the unit. The self-assessment statements help the students to determine their ability to perform the unit objectives.

**Goldenrod:** Introduction - Contains a brief motivational statement describing the theme of the unit.

**Salmon:** Tools, Materials, and Equipment - This section introduces new tools, materials, and equipment necessary for a given psychomotor skills lesson.

**Canary:** Steps of Procedure - Presents a step by step explanation and illustration of a given skill.

**Pink:** Student Evaluation - These sheets are used by the instructor to evaluate student performance. Three different forms of evaluation are presented; true-false, identification, and Steps of Procedure evaluation.

It should be noted that the material within this curriculum was developed to provide a source and guideline for the instructor. The responsibility of the instructor will be to adapt material as is necessary to suit a given teaching/learning situation. It is hoped that this material will provide that basis.



# Vocational Preparation Curriculum CARPENTRY

## Acknowledgments

The Vocational Preparation Curriculum guide is the outcome of the expenditure in time, effort and talents of the following individuals.

### Committee Members:

Ed Flanigan, Instructor, Waynesville Area Vocational-Technical School

Steve Parker, Instructor, Rolla Area Vocational-Technical School

Jim Walker, Instructor, Cass County Area Vocational-Technical School, Harrisonville, MO

Robert Wagner, Instructor, Graff Area Vocational-Technical School, Springfield, MO

Mr. Miles Beachboard, Director of Vocational Special Needs Programs, Department of Elementary and Secondary Education, Jefferson City, Missouri

Mr. Larry Lutz, Director, Camdenton Area Vocational-Technical School

Mr. Daniel Omer, Supervisor of Vocational Special Needs Programs Department of Elementary and Secondary Education, Jefferson City, MO

A special thanks goes to all the other individuals who made contributions toward the completion of this project.

In preparing this curriculum, we wish to acknowledge the contributions made by Hogan Usoro, Research Assistant, Instructional Materials Lab. Through his time and effort, Vocational Preparation Curriculum, Carpentry originated.

Instructional Materials Laboratory, University of Missouri-Columbia

Joe Gaschen: Staff Artist for illustration, design and paste-up work

Shelly Brand: Composition typist, for her work in typesetting and editing

Phyllis Miller: Editor, for editing the curriculum material

Daniel Stapleton: Graphic Artist

Dr. Harley Schlichting: Director of Instructional Materials Laboratory, for assistance in the preparation and completion of this Vocational Preparation Curriculum

Appreciation is also expressed to Dr. F.M. Miller of the Practical Arts and Vocational-Technical Education department and Dr. C.T. Cameron, Special Education department, University of Missouri-Columbia, for their contributions toward the development of the format in this curriculum.

## Notes to the Instructor

- Step 1 Read through the information in this unit before presenting it to the student.
- Step 2 Make sure all tools and materials to be used in this unit are available.
- Step 3 Prepare any handouts, if applicable, to aid student learning activities.
- Step 4 Provide the student with self-assessment (objective) sheet.
- Step 5 Discuss tasks on self-assessment sheet and give directions for completing the Show What You Can Do section.
- Step 6 Have student complete self-assessment sheet.
- Step 7 If the student elects to take the Practical Exercise and completes it to the satisfaction of the instructor, have the student proceed to the next unit. If the student fails to complete the Practical Exercise to your satisfaction or does not wish to take the exercise, proceed to Step 8.
- Step 8 Provide and discuss the Introduction sheet with the student. At this time you can also discuss the Tool, Materials and Equipment list.
- Step 9 Provide the student with Steps of Procedure.
- Step 10 Present the Steps of Procedure. Depending on the capabilities of the student, select one or more of the following means of presentation:
  - a. have student study information independently,
  - or
  - b. go through the Steps of Procedure with the student individually or as a group.
- Step 11 Instructor can demonstrate the procedures to the student or the group.
- Step 12 Allow the student time to practice the procedure.
- Step 13 When the student feels ready, use the Practical Exercise Checklist to evaluate the student's performance capabilities.

## Additional Suggestions for the Instructor

Try team approach when possible.

Beginning students can work together after instructor's demonstration.

One student experienced with the procedures can work with a beginner.

For non-readers, audiotapes or videotapes of the lesson could be prepared.

Review tools and materials with the students whenever necessary. Tools and Materials Identification Exercises are provided in some units for instructors' use.

Tools and Materials Identification Exercises can be used in the following suggested way:

As a pencil and paper exercise

Actual Tool/Material Identification: Instructor holds up or points to an actual tool or material for the student to identify, or the instructor names a particular tool or material and asks the student to locate it.

Name-Object Association: Instructor prepares cards with names of tools and materials. The student matches the name card with correct object.

Additional modifications of above suggestions can be effected by the instructor to take care of other special needs conditions.

Plan visits to local carpentry shops.

## CLASS PROGRESS CHART

viii

Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 1**

**Job Opportunities in Carpentry**



## Unit 1

### Job Opportunities in Carpentry

#### Job Opportunities in Carpentry

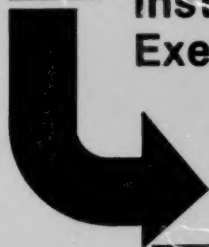
After you study this lesson you should be able to:

1. Name businesses in your community that hire carpenters.
2. Identify different types of jobs related to carpentry.
3. Name and describe carpentry jobs that you would like to hold and give reasons for your choice.

#### Show What You Can Do.

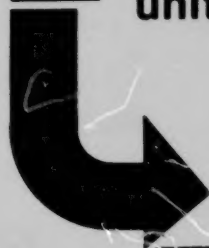
Check the statement that fits you best.

1. ☐ I can do all the tasks above and want my instructor to give me the Practical Exercise.



**SEE YOUR INSTRUCTOR**

2. ☐ I want to study the information in this unit before I do the Practical Exercise.

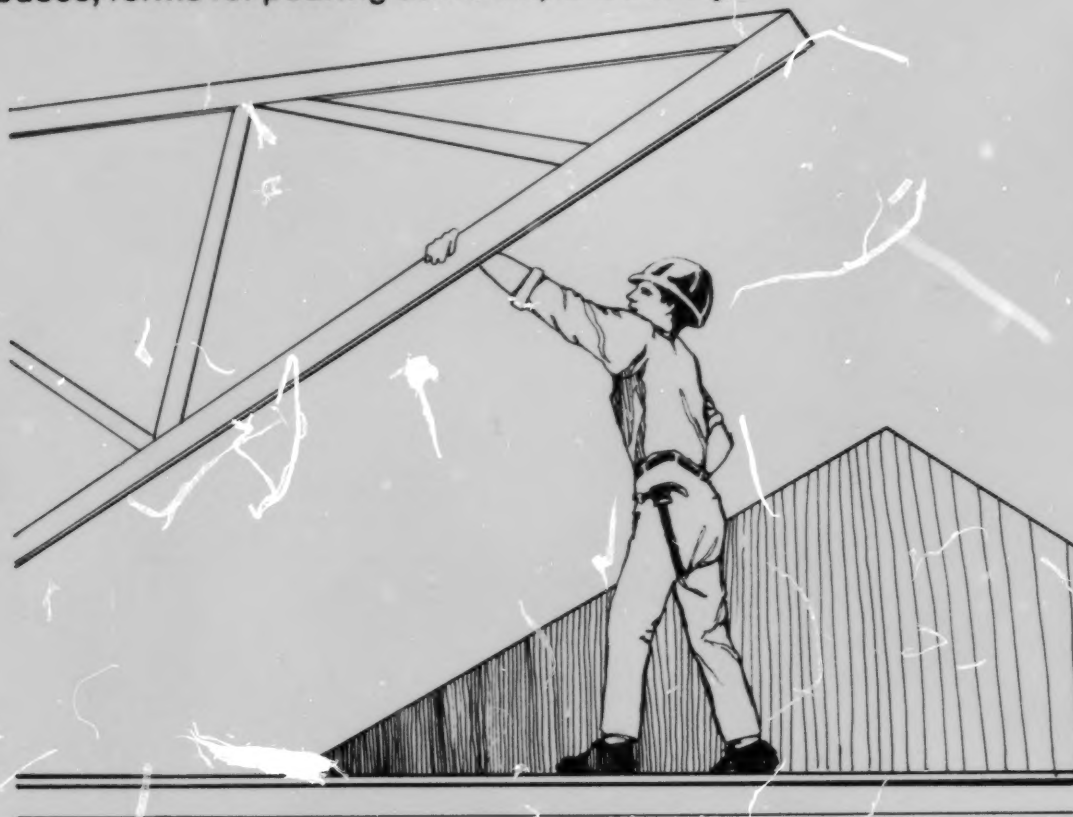


**TURN THE PAGE AND BEGIN**

## Unit 1 Job Opportunities in Carpentry

### Introduction

Carpentry is the largest single skilled trade in the woodworking industry. Carpenters are needed to build wood structures such as houses, forms for pouring concrete, and other jobs.



If you want to become a skilled carpenter, you must receive proper training in the area of carpentry which interests you.

Carpenters must be able to measure, cut and join together wood as a part of their jobs.

In this lesson, you will learn about carpentry jobs which are available to you after proper training.

**TURN TO NEXT PAGE**

## **Unit 1**

### **Job Opportunities in Carpentry**

#### **A. Carpentry Related Jobs In Your Community.**

Carpenters are important to the community because so many things are made out of wood. Most buildings built today are built of wood on top of concrete that is poured into a wooden frame. Carpenters do a wide variety of wood construction tasks and must have the knowledge and skills required to do each job.

Let's discuss jobs that carpenters do in your community.

1. Can you name a carpentry business in your community?

---

2. What kind of jobs does the carpentry business do?

---

3. Can you name another carpentry business?

---

Talk about these businesses with your instructor or with the class. Look in the newspaper for carpentry jobs.

## Unit 1

### Job Opportunities in Carpentry

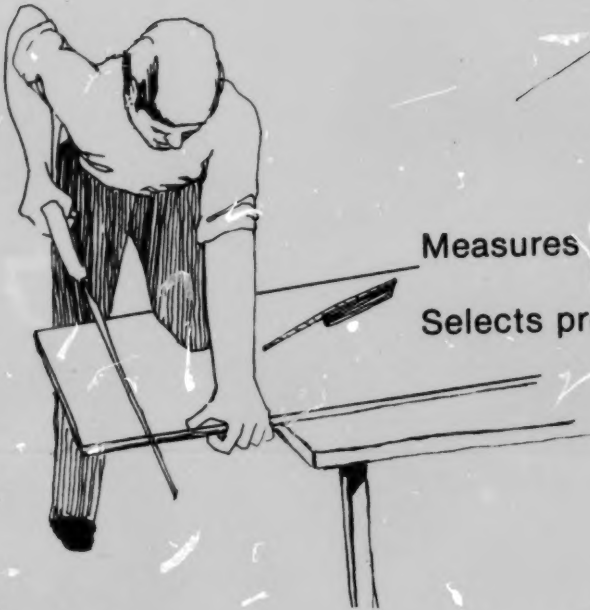
#### B. Identify the Different Types of Jobs Related to Carpentry.

Carpentry is one of the higher paying jobs for skilled workers. It is also a job which will always need more workers. There are many jobs for carpenters. They include:

##### 1. Carpenter's Helper: Assists the carpenter by doing a variety of tasks:

Arranges or moves tools, materials and equipment.

Cleans and prepares work area for carpentry jobs.



Measures and cuts lumber.

Selects proper hand tools for certain jobs.

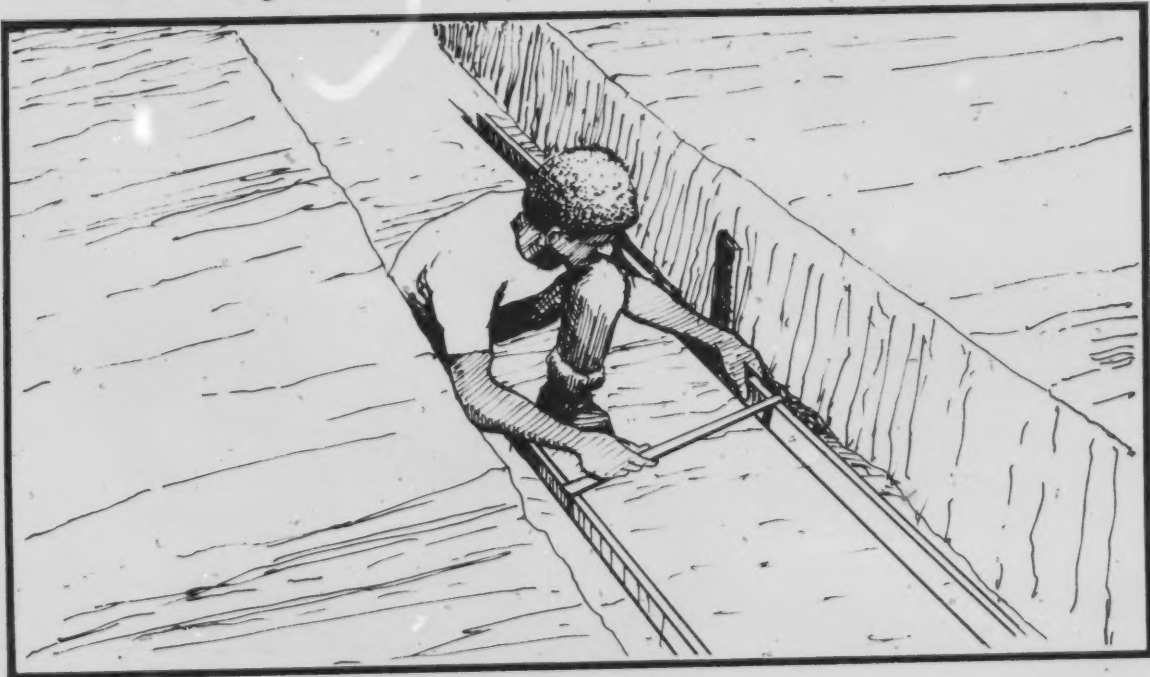




2. **Framing Carpenter:** Builds frames for structures. Must be able to read building plans, measure, cut and nail.



3. **Form Builder:** Builds wood forms in which concrete is poured for building foundations or concrete structures.



4. **Dry Wall Installer:** Installs and finishes sheetrock in building interiors.



5. **Finish Carpenter:** Finishes the interior of a structure. Is trained to install doors, trim, paneling, and windows.



6. **Cabinet Maker:** Makes and installs cabinets or furniture.



7. **Building Supply Worker:** Works as a salesperson in a lumber yard or building supply center. This worker will drive trucks, stock material and work with the public.



8. **Building Maintenance Person:** Does minor remodeling and repair for maintenance of a building.



9. **Roofer:** Installs and repairs roofing materials on roofs.



**SEE YOUR INSTRUCTOR**

# Unit 1

## Job Opportunities in Carpentry

### Practical Exercise Performance Checklist.

Student's Name: \_\_\_\_\_

#### True-False Questions:

Circle "T" if the statement is true and "F" if it is false.

- T F 1. Carpentry is not a skilled trade in the woodworking industry.
- T F 2. A carpenter's helper does many tasks to make the carpenter's work easier.
- T F 3. A framing carpenter is an expert at laying roofs.
- T F 4. A form builder would build the wood forms into which concrete is poured.
- T F 5. A finish carpenter is experienced in cutting and nailing interior trim.
- T F 6. A dry wall installer pours concrete for basement walls.
- T F 7. A cabinet maker builds and installs wooden kitchen cabinets.
- T F 8. A lumberyard worker hauls material to a construction site.
- T F 9. A building maintenance person does nothing but change lightbulbs.
- T F 10. A roofer is an expert at laying carpet.

Satisfactory Performance ☐  
Repeat Exercise ☐  
Should Move On ☐

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date



Vocational Preparation Curriculum  
**CARPENTRY**



Unit 2

**Safety Rules in Carpentry**

## Unit 2 Safety Rules in Carpentry

### Safety Rules in Carpentry

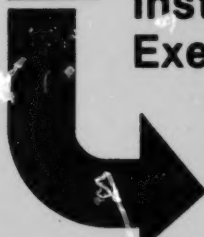
After you study this lesson, you should be able to:

1. Identify unsafe work situations in carpentry.
2. Show safe work habits in the carpentry shop.

### Show What You Can Do.

Check the statement that fits you best.

1. ☐ I can do all the tasks above and want my instructor to give me the Practical Exercise.



**SEE YOUR INSTRUCTOR**

2. ☐ I want to study the information in this unit before I do the Practical Exercise.



**TURN THE PAGE AND BEGIN**

## Unit 2 Safety Rules in Carpentry

### Introduction

Safety is important in all types of carpentry work. Safe work habits protect not only the individual but also fellow workers. You are responsible not only for your own safety but for the safety of others working with you.



In this unit, you will learn about safety rules in carpentry.

**TURN TO NEXT PAGE**

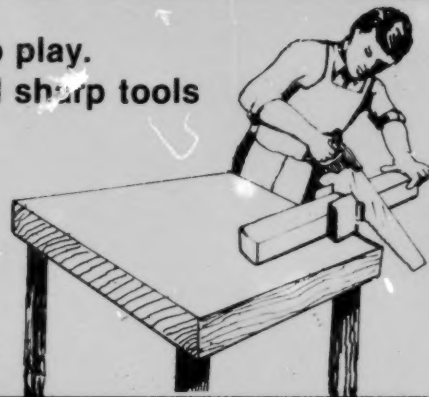
## Unit 2

### Safety Rules in Carpentry

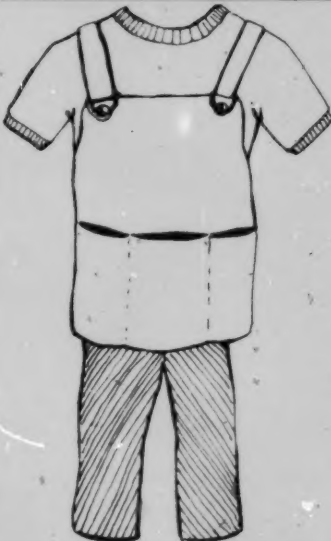
1. Report all accidents to your instructor.



2. The carpentry shop is no place to play.  
Sharp corners, hard surfaces, and sharp tools  
can lead to injury.



3. Wear clothing which can NOT be caught  
in tools or equipment and cause injury.



4. Operate power tools and equipment only after getting approval of the instructor.



5. Wear proper safety clothing and eye protection at all times.



6. Always clean your work area.





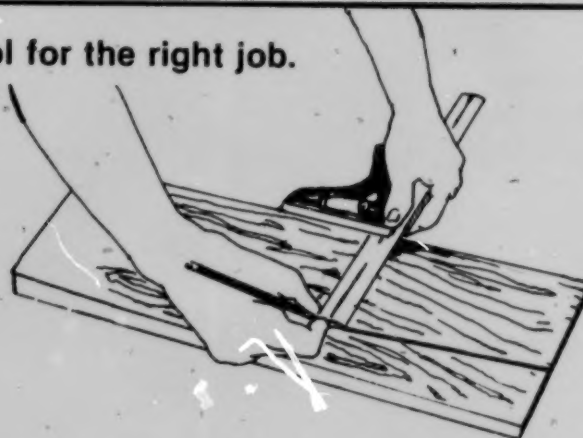
**7. Never wear jewelry when operating power tools or machines.**



**8. Carry tools safely. Carrying sharp tools in your pocket can injure you or someone else.**



**9. Always use the right tool for the right job.**



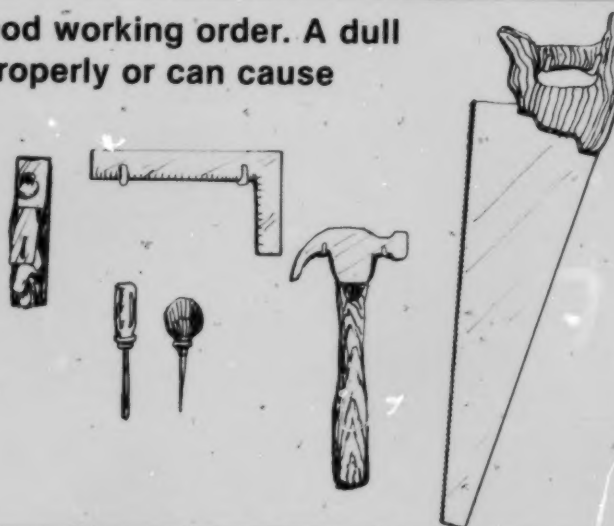
10. Always be willing to help others. Teamwork makes jobs easier and safer.



11. Read all safety rules, posters, and notices before operating any machine.



12. Keep all tools in good working order. A dull tool will not work properly or can cause an accident.



SEE YOUR INSTRUCTOR

## Unit 2 Safety Rules in Carpentry

### Practical Exercise Performance Checklist

Student's Name: \_\_\_\_\_

#### True-False Questions:

Circle "T" if the statement is true and "F" if it is false.

- T F 1. Only major shop accidents should be reported.
- T F 2. You can play in the carpentry shop when you don't have anything to do.
- T F 3. You should never wear loose clothing in the shop.
- T F 4. You must seek approval from your instructor before operating any power tool or equipment.
- T F 5. It is a good safety habit to clean your work area.
- T F 6. Wearing rings or other jewelry is dangerous in the carpentry shop.
- T F 7. It is advisable to read all the safety posters and notices before you operate any machine.
- T F 8. A sharp tool is a safe tool if used correctly.
- T F 9. To work safely, you must use the right tool for the right job.
- T F 10. Pointed tools can be safely carried in your pocket.

Satisfactory Performance ☐  
Repeat Exercise ☐  
Should Move On ☐

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date

Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 3**

**Basic Hand Tools  
Used in Carpentry**

## Unit 3

### Basic Hand Tools Used in Carpentry

#### Basic Hand Tools Used in Carpentry

After you study this lesson, you should be able to:

1. Identify the basic hand tools used in carpentry.
2. Demonstrate the ability to use each tool safely and according to the recommended use.

#### Show What You Can Do.

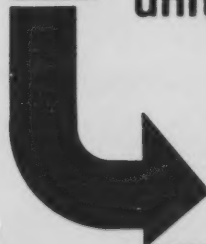
Check the statement that fits you best.

1. ☐ I can do all the tasks above and want my instructor to give me the Practical Exercise.



**SEE YOUR INSTRUCTOR**

2. ☐ I want to study the information in this unit before I do the Practical Exercise.



**TURN THE PAGE AND BEGIN**



## Unit 3

### Basic Hand Tools Used in Carpentry

#### Introduction

In the carpentry trade many hand woodworking tools are used. As a carpenter, you will need to know how to use and identify woodworking tools. Just knowing how to use tools correctly may make the difference between doing the job well and doing it poorly.



Carpenter Brace

In this unit you will learn how to use and identify hand woodworking tools.

TURN TO NEXT PAGE 28

## Unit 3

### Basic Hand Tools Used in Carpentry

#### A. Measuring and Layout Tools Used In Carpentry.

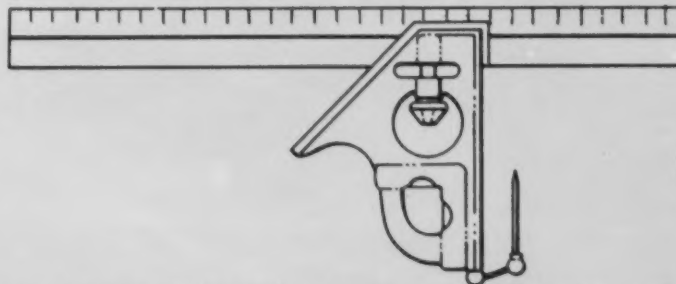
1. **Framing Square:** Used to lay out rafters and stairs. Also checks squareness of board end.



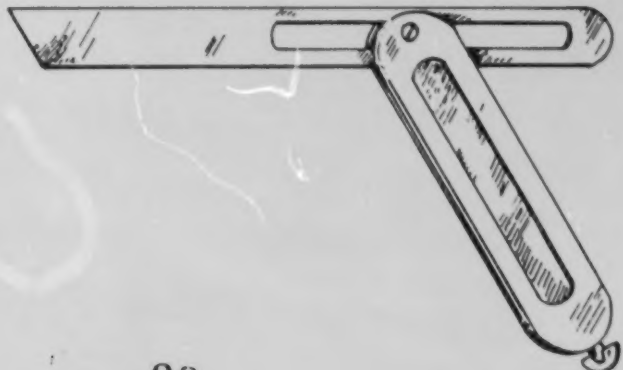
2. **Try Square:** Used to check board surfaces for squareness.



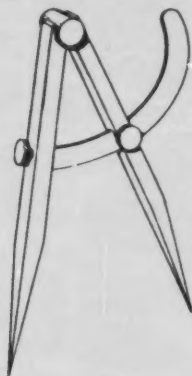
3. **Combination Square:** Has a movable head and is used as a straightedge, depth gauge, marking gauge and for checking angles.



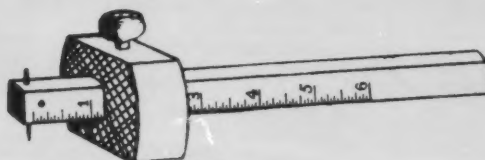
4. **Bevel Square:** An adjustable square used to transfer an angle.



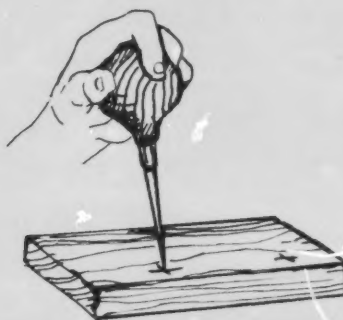
5. **Divider:** Used to transfer measurements or scribe arcs and circles.



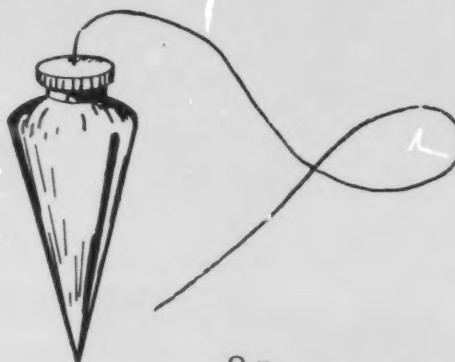
6. **Marking Gauge:** Used to lay out lines parallel to the edges of a material.



7. **Scratch Awl:** Used to mark lines on the surface of materials.



8. **Plumb Bob:** Used in checking and laying out vertical and horizontal lines.



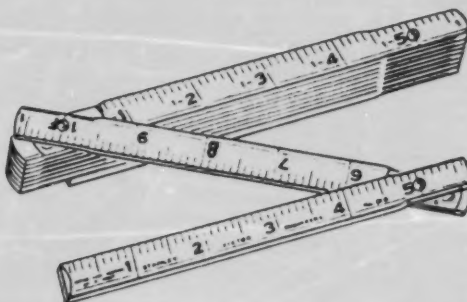
9. **Chalk Line:** A chalk-coated line used to mark long, straight lines.



10. **Level:** Used to check levelness of vertical and horizontal surfaces.



11. **Folding Rule:** Most commonly used measuring device.



12. **Push-Pull Tape:** Used for measuring lumber and openings.



**TURN TO NEXT PAGE**

## Unit 3

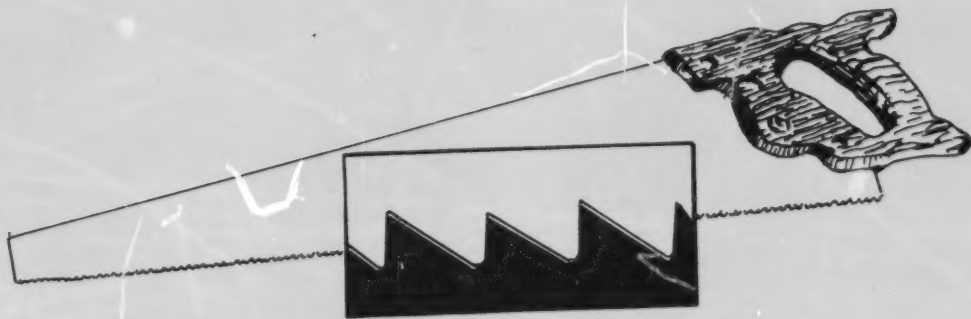
### Basic Hand Tools Used in Carpentry

#### B. Cutting Tools Used in Carpentry.

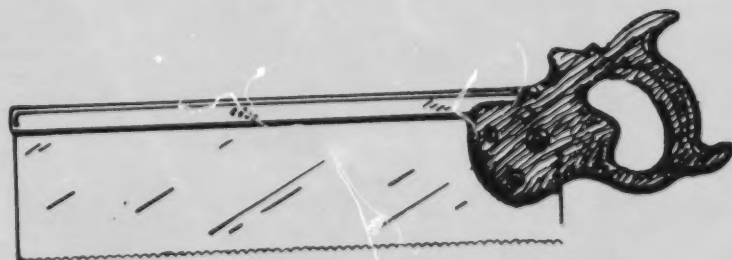
1. **Crosscut Saw:** Used to cut across the wood grain.



2. **Rip Saw:** Used to rip lumber with the grain.

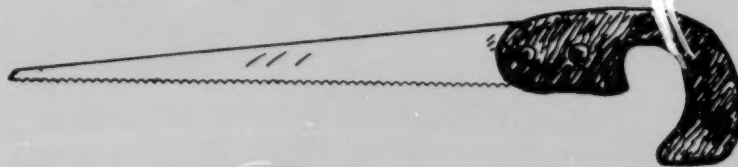


3. **Back Saw:** Used to make fine cuts in molding.

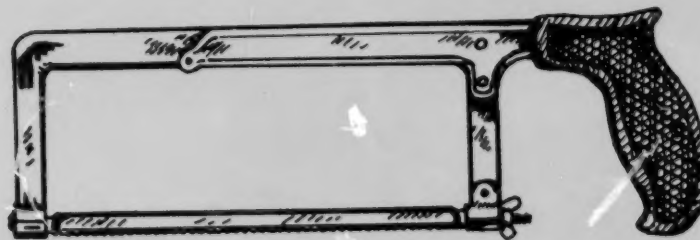




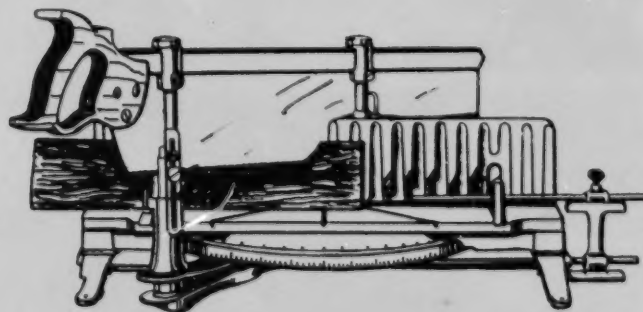
4. **Keyhole Saw:** Used for making irregular cuts.



5. **Hacksaw:** Used to cut metal parts such as fasteners, conduit, cables, bolts, etc.



6. **Miter Box Saw:** Used to make precise angular cuts on wood.



7. **Jack Plane:** Used for general purpose planing. Size is usually 11 to 14 inches in length.



8. **Block Plane:** Used for cutting end grain. It's size is usually 6 to 7 inches in length.



9. **Wood Chisel:** Used to trim and cut away wood to form joints.



10. **Utility Knife:** Used to cut and trim small pieces of wood and plastics.



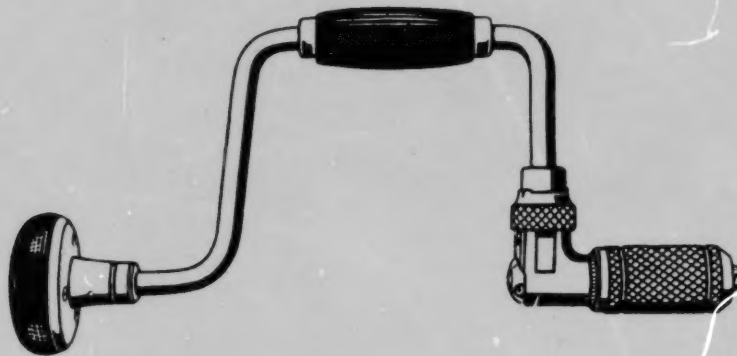
**TURN TO NEXT PAGE**

## Unit 3

### Basic Hand Tools Used in Carpentry

#### C. Drilling and Boring Tools Used in Carpentry.

1. **Hand Brace:** Used to hold bits for boring holes in wood.



2. **Auger Bit:** Used with hand brace to drill holes in wood.



3. **Push Drill:** Hand tool used to drill holes quickly.



4. **Twist Drill:** Used for drilling holes in wood and metal.



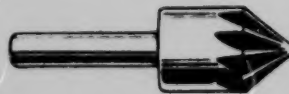
5. **Hand Drill:** Used with twist drills to drill small holes for screws and nails.



6. **Expansive Bit:** Used for drilling large holes and is adjustable.



7. **Countersink:** Used to recess the heads of screws.



**TURN TO NEXT PAGE**

36

## Unit 3

### Basic Hand Tools Used in Carpentry

#### D. Fastening Tools Used in Carpentry.

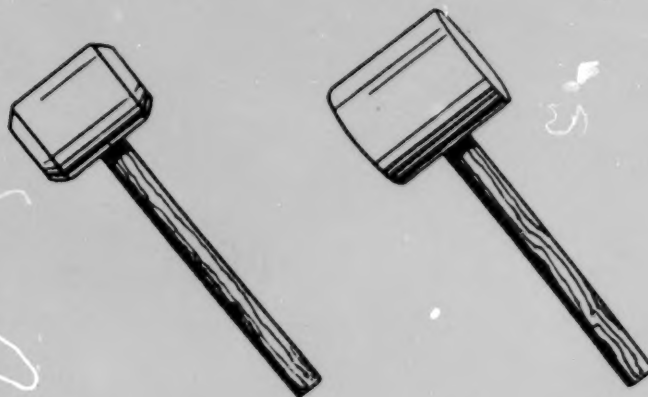
1. **Curved Claw Hammer:** Used for driving and pulling nails.



2. **Straight Claw Hammer:** Used for ripping lumber apart.

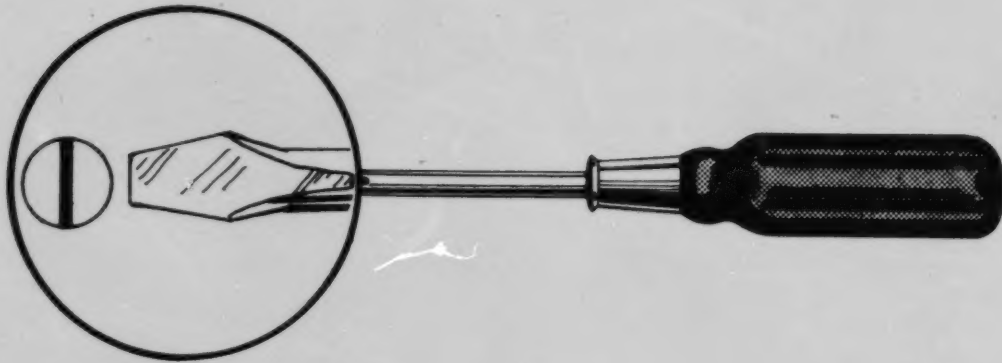


3. **Soft Faced Hammer:** Hammer with rawhide, plastic or wood head used with wood chisels.

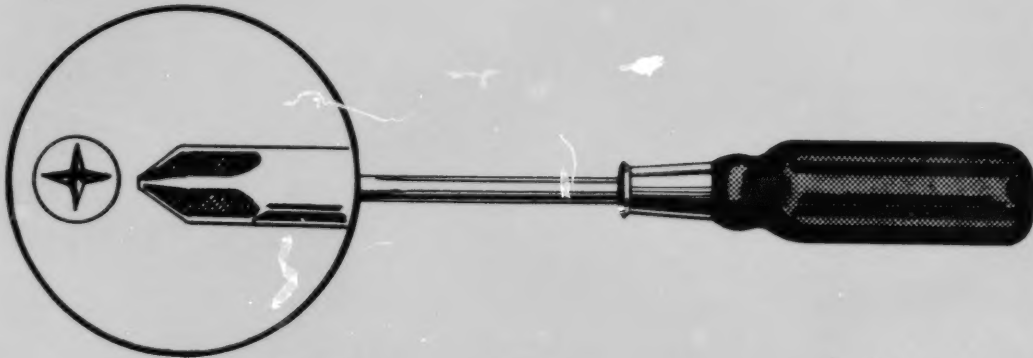




4. **Standard Screwdriver:** Used to install and remove slotted screws.



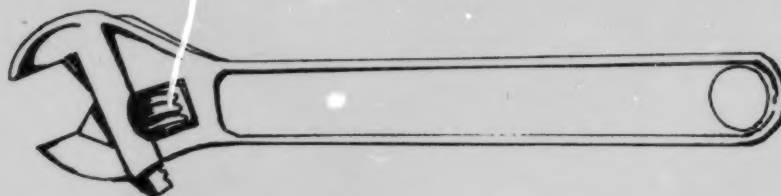
5. **Phillips Screwdriver:** Used to install and remove cross slotted screws.



6. **Nail Set:** Used with the hammer to sink nail heads into wood.



7. **Adjustable Wrench:** Used to remove and install nuts and bolts.



8. **Hatchet:** Used to trim wood pieces and nail flooring.



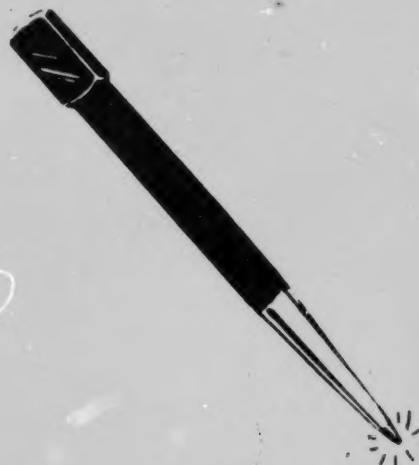
9. **Pliers:** Used to grip small pieces of wire, wood or metal.



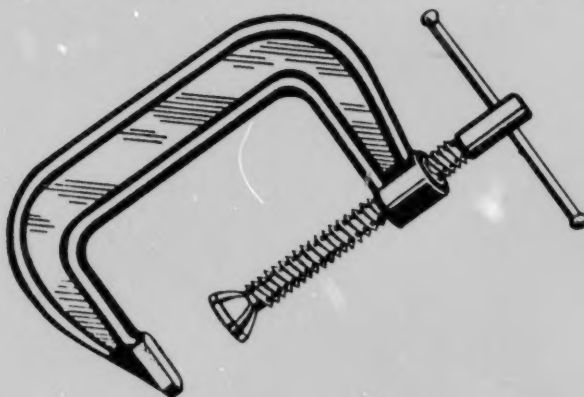
10. **Ripping Bar:** Used to strip concrete forms, pry lumber and pull nails.



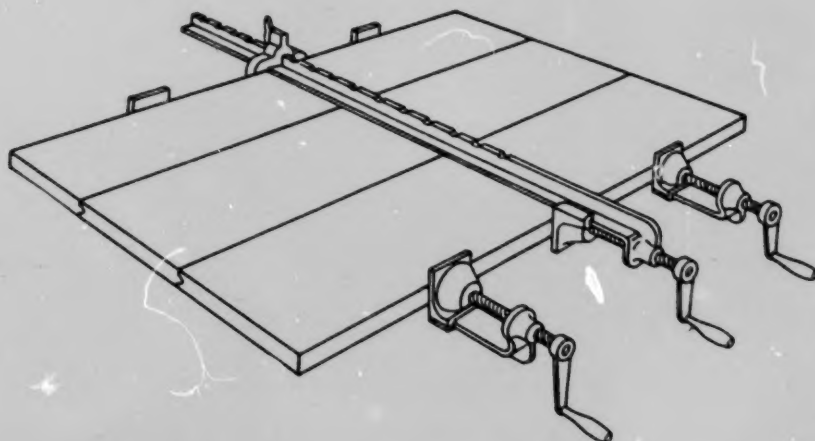
11. **Center Punch:** Used for marking the center of a hole to be drilled.



12. **C-Clamp:** Adjustable device used to hold wood or metal.



13. **Bar Clamp:** Used to assemble products and hold glued edges.



**SEE YOUR INSTRUCTOR**

# Unit 3

## Basic Hand Tools Used in Carpentry

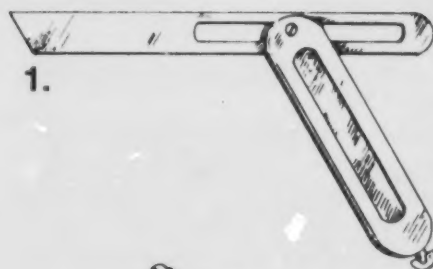
### Tools and Materials Identification Exercise

Student's Name: \_\_\_\_\_

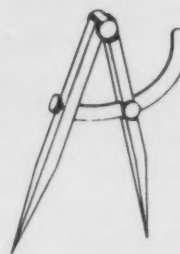
Match each tool with its correct name.

#### Measuring and Layout Tools

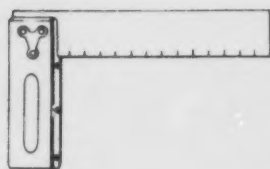
- \_\_\_\_\_ A. Framing Square
- \_\_\_\_\_ B. Try Square
- \_\_\_\_\_ C. Combination Square
- \_\_\_\_\_ D. Bevel Square
- \_\_\_\_\_ E. Divider
- \_\_\_\_\_ F. Marking Gauge



1.



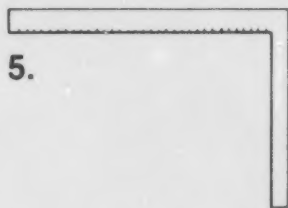
2.



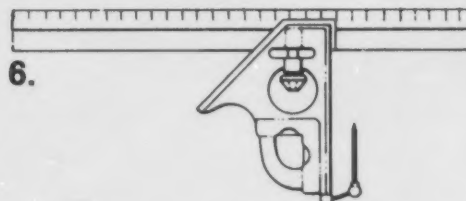
3.



4.



5.



6.

41

\_\_\_ G. Scratch Awl

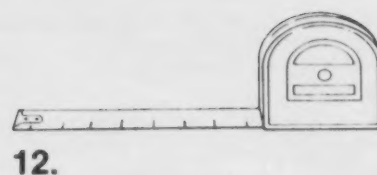
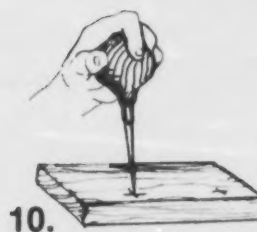
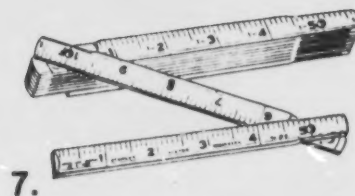
\_\_\_ H. Plumb Bob

\_\_\_ I. Chalk Line

\_\_\_ J. Level

\_\_\_ K. Push-Pull Tape

\_\_\_ L. Folding Rule





# Unit 3

## Basic Hand Tools Used in Carpentry

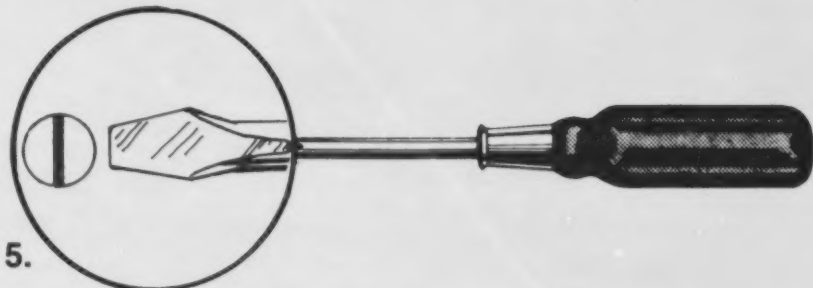
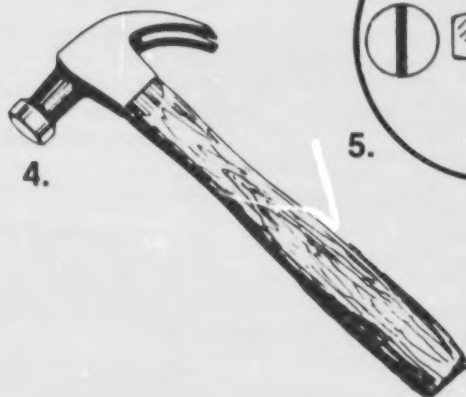
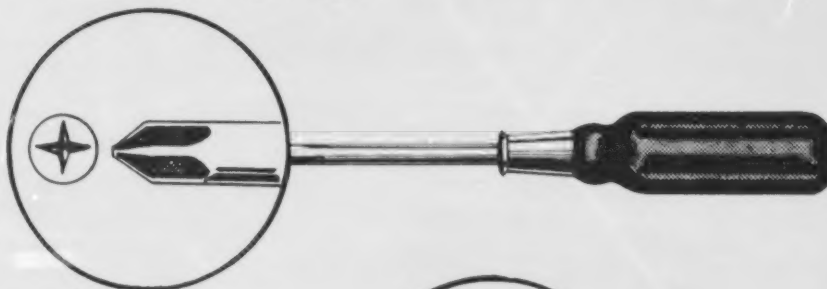
### Tools and Materials Identification Exercise.

Student's Name: \_\_\_\_\_

Match each tool with its correct name.

#### Fastening Tools

- \_\_\_\_\_ A. Curved Claw Hammer
- \_\_\_\_\_ B. Straight Claw Hammer
- \_\_\_\_\_ C. Soft Faced Hammer
- \_\_\_\_\_ D. Standard Screwdriver
- \_\_\_\_\_ E. Phillips Screwdriver
- \_\_\_\_\_ F. Nail Set



\_\_\_ G. Adjustable Wrench

\_\_\_ H. Hatchet

\_\_\_ I. Pliers

\_\_\_ J. Ripping Bar

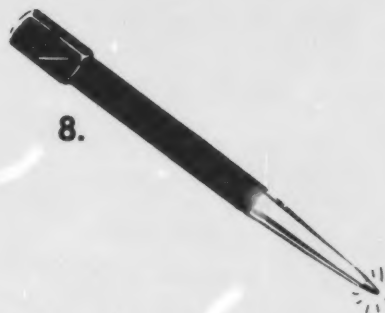
\_\_\_ K. Center Punch

\_\_\_ L. C-Clamp

\_\_\_ M. Bar Clamp



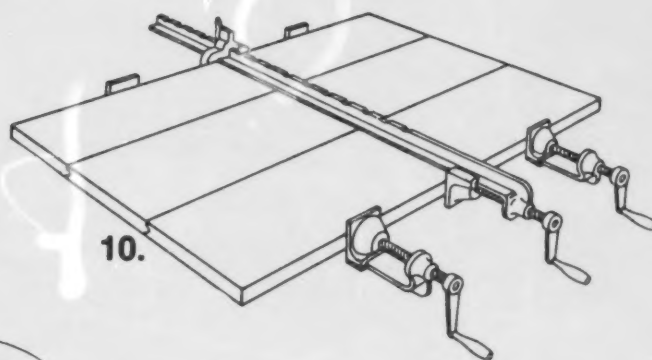
7.



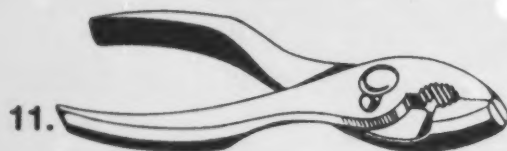
8.



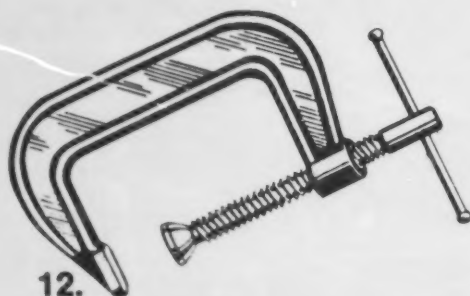
9.



10.



11.



12.



13.

44

# Unit 3

## Basic Hand Tools Used in Carpentry

### Tools and Materials Identification Exercise.

Student's Name: \_\_\_\_\_

Match each tool with its correct name.

#### Cutting Tools

\_\_\_\_\_ A. Crosscut Saw

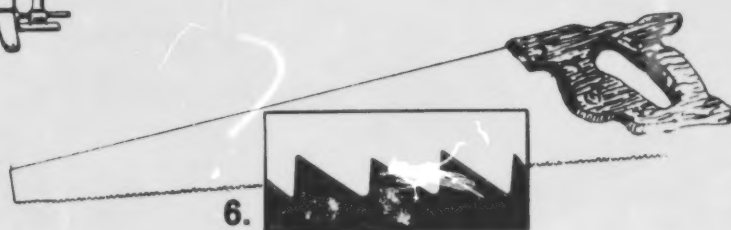
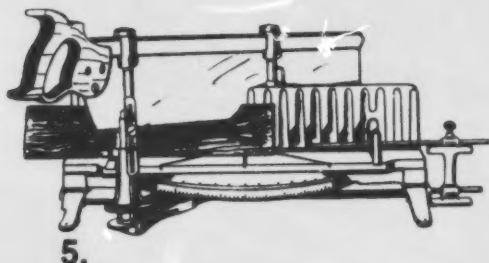
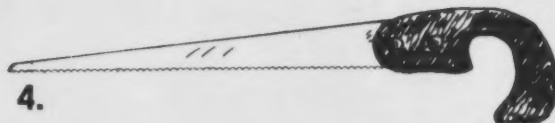
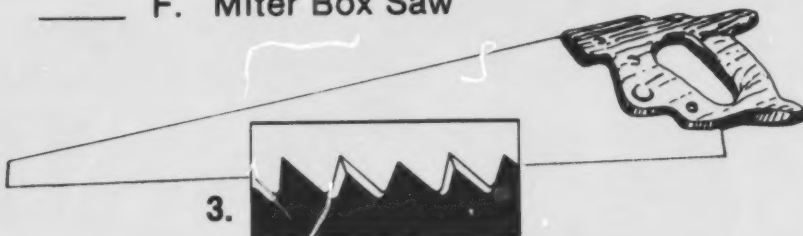
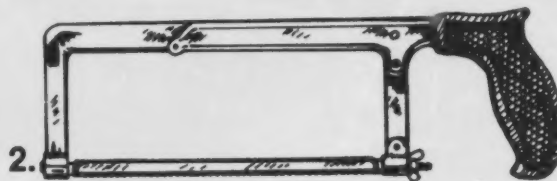
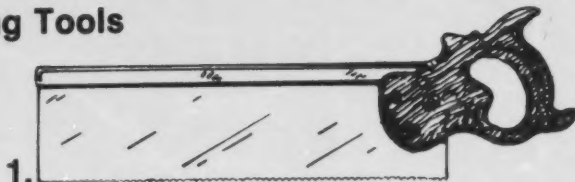
\_\_\_\_\_ B. Rip Saw

\_\_\_\_\_ C. Back Saw

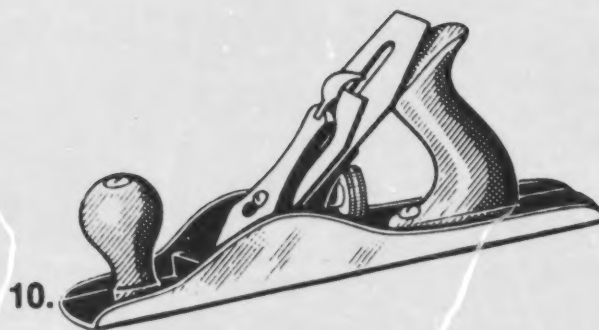
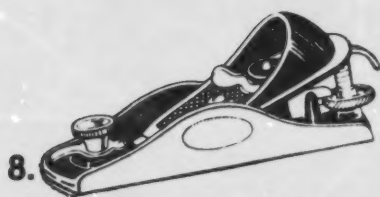
\_\_\_\_\_ D. Keyhole Saw

\_\_\_\_\_ E. Hacksaw

\_\_\_\_\_ F. Miter Box Saw



- \_\_\_\_\_ G. Jack Plane
- \_\_\_\_\_ H. Block Plane
- \_\_\_\_\_ I. Wood Chisel
- \_\_\_\_\_ J. Utility Knife



Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 4**

**Reading and Measuring  
With Rulers**



## Unit 4

### Reading and Measuring With Rulers

#### Reading and Measuring With Rulers

After you study this lesson, you should be able to:

1. Identify tools and materials used in reading and measuring with rulers.
2. Read the ruler in whole numbers
3. Read fractions of an inch on a given ruler.
4. Measure objects with a ruler.
5. Draw lines and objects to length using a ruler.

Show What You Can Do.

Check the statement that fits you best.

1.

☐

I can do all the tasks above and want my instructor to give me the Practical Exercise.



SEE YOUR INSTRUCTOR

2.

☐

I want to study the information in this unit before I do the Practical Exercise.



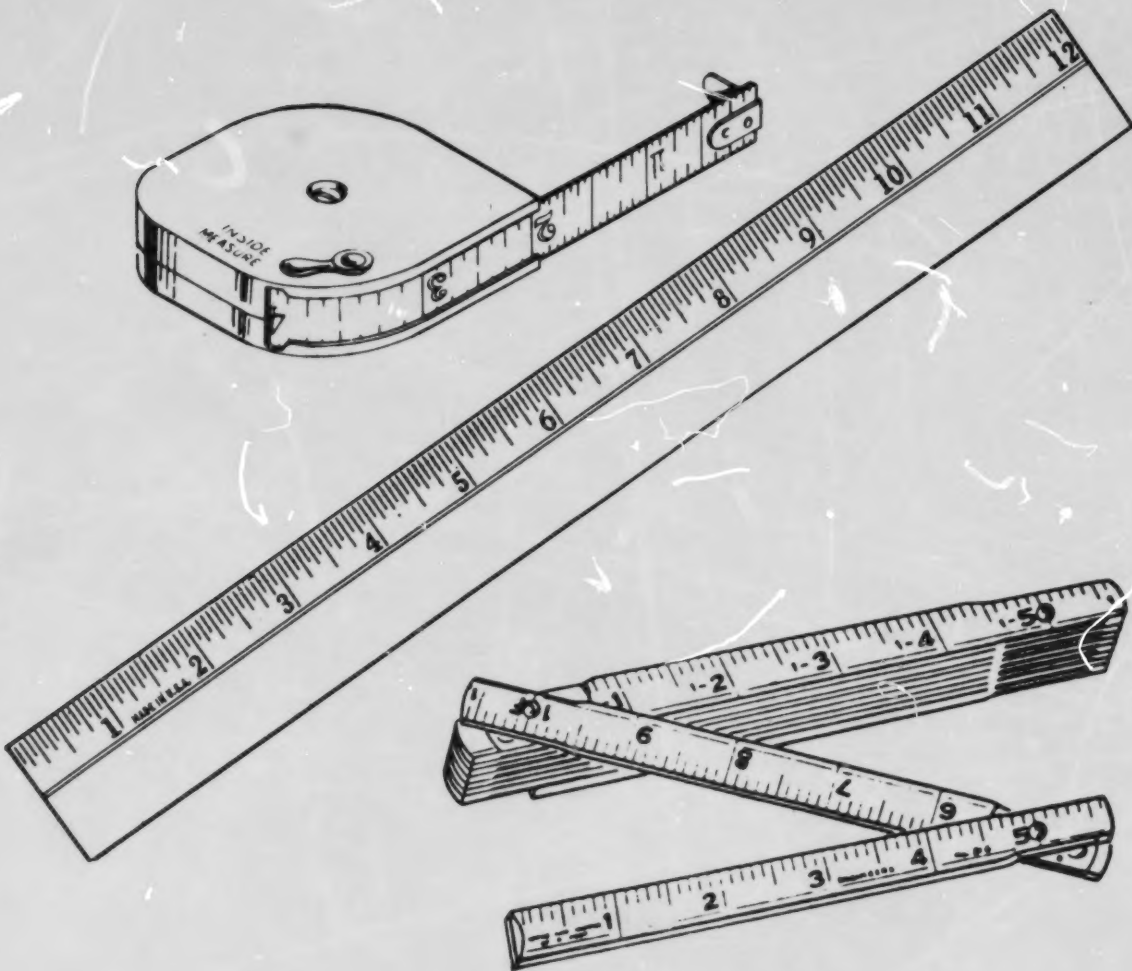
TURN THE PAGE AND BEGIN

## Unit 4

# Reading and Measuring With Rulers

### Introduction

The ruler is the most important of all hand tools. Without the use of the ruler it would be difficult to build anything accurately.



In this unit you will study how to use different types of rulers and how to read them.

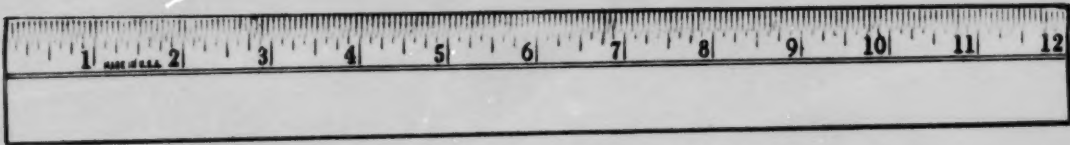
**TURN TO NEXT PAGE**

## Unit 4

### Reading and Measuring With Rulers

#### A. Tools, Materials and Equipment for Reading and Measuring With Rulers.

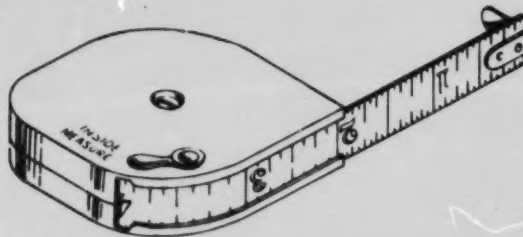
1. **12" RULER (GRADUATIONS IN 1/16"):** Used to measure materials and complete assignments.



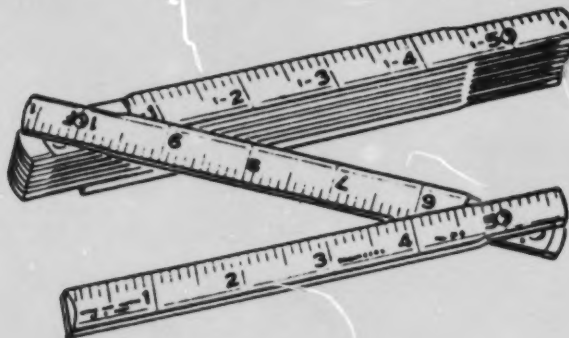
#### 2. PENCIL AND PAPER:



3. **TAPE RULE:** Used to measure objects and lumber.



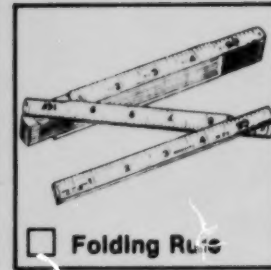
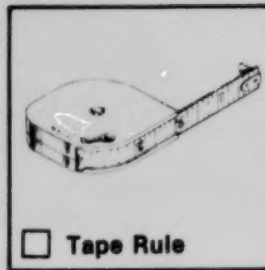
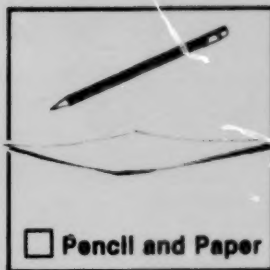
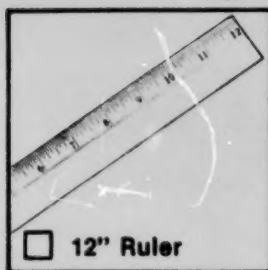
4. **FOLDING RULE:** Used to measure objects and lumber.



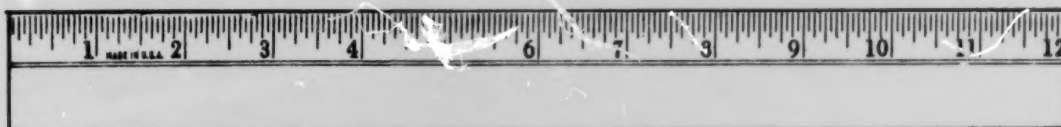
**TURN TO NEXT PAGE**

## B. Steps for Reading and Measuring With Rulers.

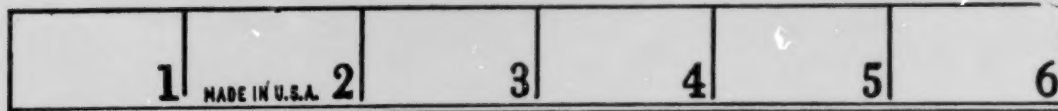
1. Find and Check Off the following:



2. Secure a 12" ruler from your instructor.

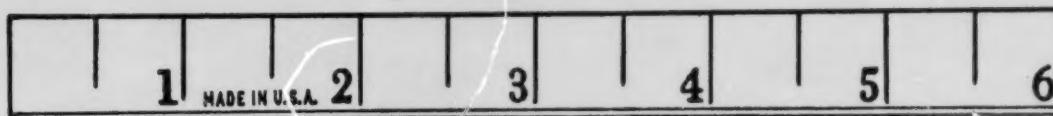


3. Using the following illustration, study the divisions of the ruler and practice reading whole units.



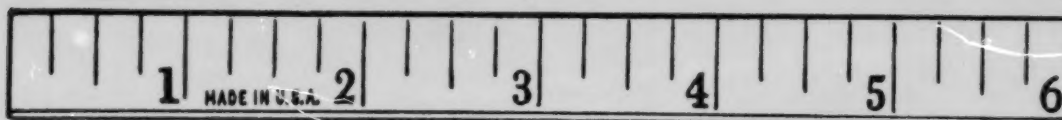
Each unit is one inch.

4. Using the following illustration, study the divisions of the ruler and practice reading half units.



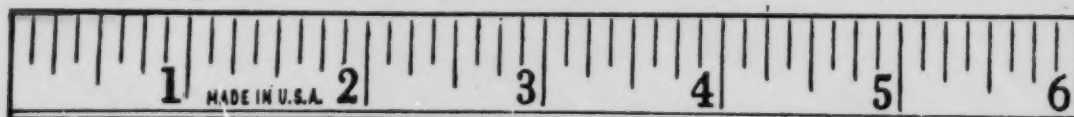
Each unit is one-half inch.

5. Using the following illustration, study the divisions of the ruler and practice reading quarter units.



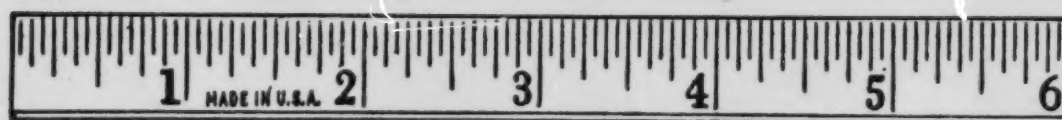
Each unit is one-quarter inch.

6. Using the following illustration, study the divisions of the ruler and practice reading eighth units.



Each unit is one-eighth inch.

7. Using the following illustration, study the divisions of the ruler and practice reading sixteenth units.

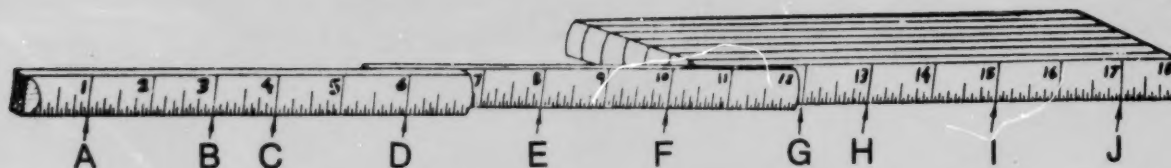


Each unit is one-sixteenth inch.



### C. Reading Whole Numbers on the Folding Ruler.

1. Using the following illustration determine the distance in inches for the given letters in the drawing.



A = \_\_\_\_

F = \_\_\_\_

B = \_\_\_\_

G = \_\_\_\_

C = \_\_\_\_

H = \_\_\_\_

D = \_\_\_\_

I = \_\_\_\_

E = \_\_\_\_

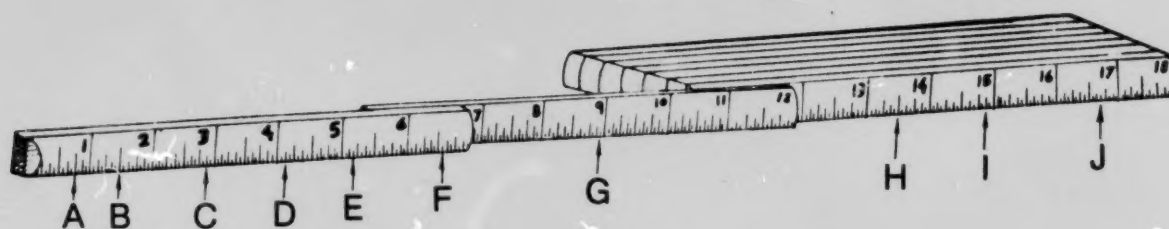
J = \_\_\_\_

#### D. Reading Fractions on the Folding Ruler

1. Using the following illustrations determine the distance in fractions for the given letters in the drawing.

**NOTE!**

12" is equal to one foot.



A = \_\_\_\_

F = \_\_\_\_

B = \_\_\_\_

G = \_\_\_\_

C = \_\_\_\_

H = \_\_\_\_

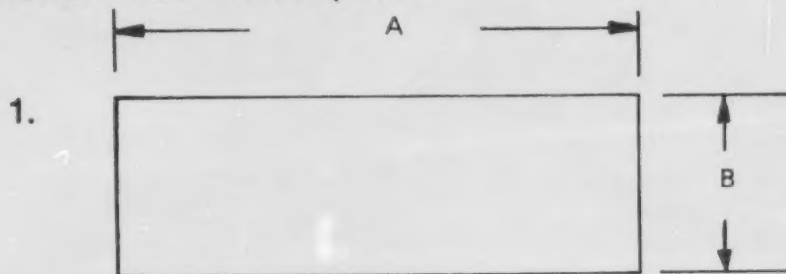
D = \_\_\_\_

I = \_\_\_\_

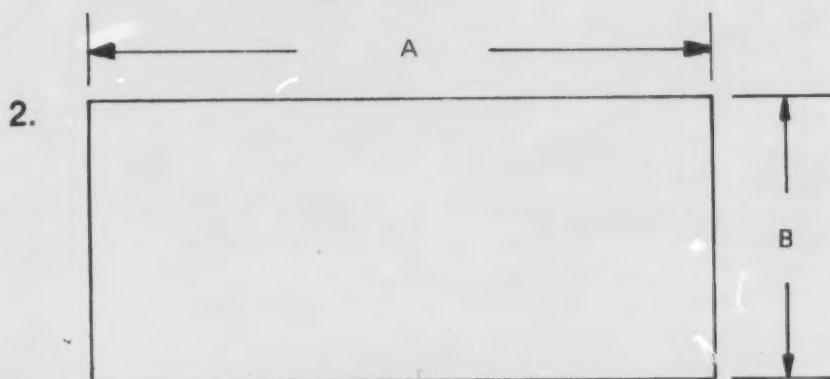
E = \_\_\_\_

J = \_\_\_\_

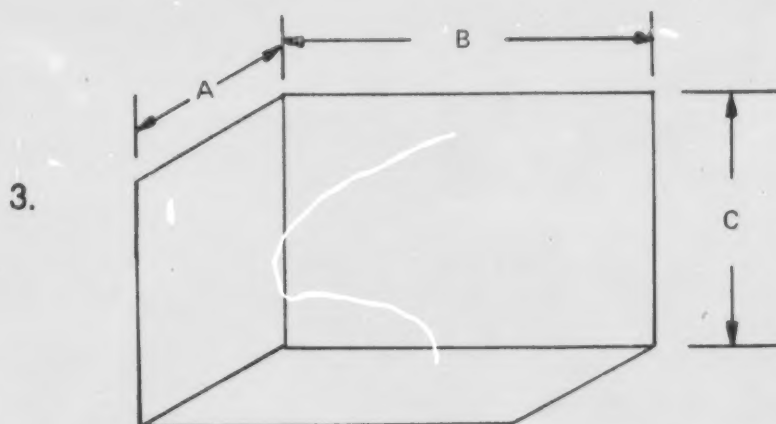
**E. Measuring Objects Using a Rule With 1/16" Graduations.**  
 Measure the correct lengths and heights below and write your answer in the blank space.



A. Length \_\_\_\_\_  
 B. Height \_\_\_\_\_



A. Length \_\_\_\_\_  
 B. Height \_\_\_\_\_



A. Width \_\_\_\_\_  
 B. Length \_\_\_\_\_  
 C. Height \_\_\_\_\_

## F. Drawing Lines With a Ruler.

1. Using a rule with  $1/16$ " graduations, mark the correct line length on the lines below.

a.  $3 \frac{3}{4}$  inches



b.  $2 \frac{1}{16}$  inches



c.  $1 \frac{1}{4}$  inches



d.  $3 \frac{10}{16}$  inches



e.  $2 \frac{1}{2}$  inches



f.  $2 \frac{5}{8}$  inches



**SEE YOUR INSTRUCTOR**

## Unit 4

### Reading and Measuring With Rulers

#### Tools and Materials Identification Exercise

Student's Name: \_\_\_\_\_

Match each object with its correct name.

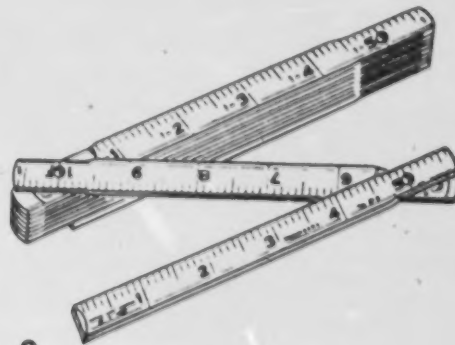
\_\_\_\_ A. Folding Rule

\_\_\_\_ B. Tape Rule

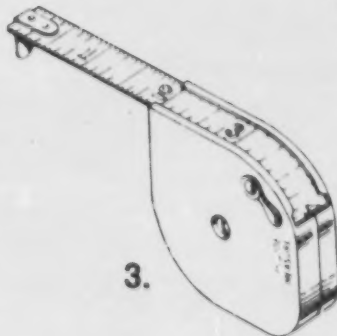
\_\_\_\_ C. 12" Ruler



1.



2.



3.



## Unit 4

### Reading and Measuring With Rulers

#### Practical Exercise Performance Checklist

The student \_\_\_\_\_ successfully performed the following tasks:

| Tasks                                                   | Yes | No | Comments |
|---------------------------------------------------------|-----|----|----------|
| 1. Identified:                                          |     |    |          |
| a. 12" Ruler                                            |     |    |          |
| b. Pencil and Paper                                     |     |    |          |
| c. Folding Rule                                         |     |    |          |
| d. Tape Rule                                            |     |    |          |
| 2. Secured 12" ruler from the instructor                |     |    |          |
| 3. Practiced reading divisions of the ruler             |     |    |          |
| 4. Properly read whole numbers on the folding ruler     |     |    |          |
| 5. Properly read fractions on the folding ruler         |     |    |          |
| 6. Measured objects using a rule with 1/16" graduations |     |    |          |
| 7. Used a ruler to draw lines to given dimensions.      |     |    |          |
| 8. Returned materials to their proper places.           |     |    |          |

Satisfactory Performance ☐

Repeat Exercise ☐

Should Move On ☐

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date

Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 5**

**Lumber Selection  
and Measurement**

## Unit 5 Lumber Selection and Measurement

### Lumber Selection and Measurement

After you have studied this lesson, you should be able to:

1. Recognize different types of lumber.
2. Understand grades of lumber.
3. Recognize defects in lumber.
4. Understand specifications of lumber.
5. Understand board foot, square foot and lineal foot measurements.

### Show What You Can Do.

Check the statement that fits you best.

1.

☐

I can do all the tasks above and want my instructor to give me the Practical Exercise.

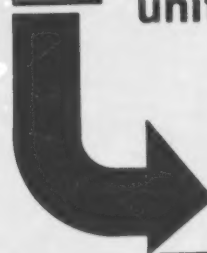


**SEE YOUR INSTRUCTOR**

2.

☐

I want to study the information in this unit before I do the Practical Exercise.

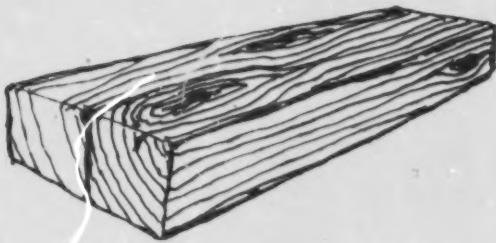


**TURN THE PAGE AND BEGIN**

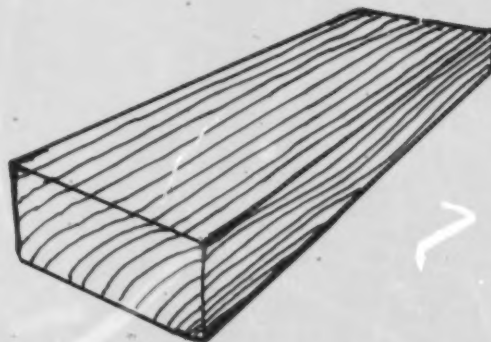
## Unit 5 Lumber Selection and Measurement

### Introduction

Wood is the most common material used in building today. When wood is cut into pieces of uniform thickness, width and length, it is called lumber. Lumber is purchased in various grades from the lumber yard.



**Economy Grade**



**Construction Grade**

In this unit you will be introduced to lumber selection, defects and measurement.

## Unit 5

### Lumber Selection and Measurement

#### A. Types of lumber.

1. **Softwood:** Any wood which is soft and easy to work with. Pine, fir and cedar are examples of softwood.



2. **Hardwood:** Any wood which is very hard. Walnut, oak and yellow birch are examples of hardwood.

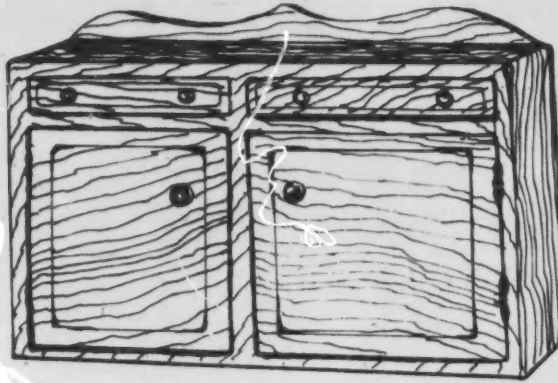


**TURN TO NEXT PAGE**

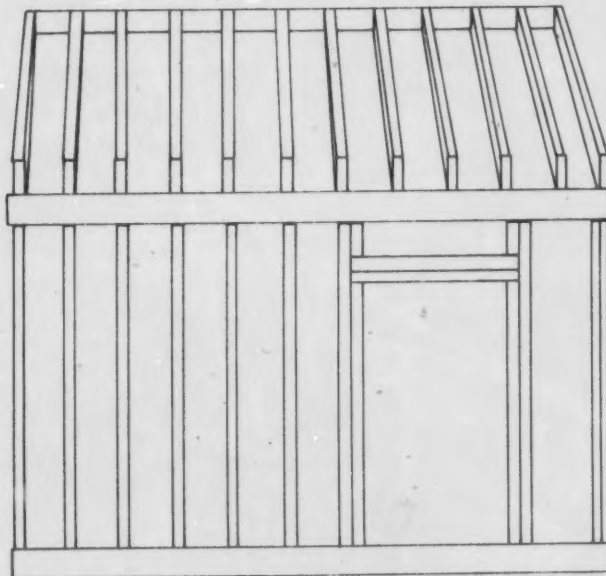


## **B. Lumber Grading.**

1. **Select:** Grade in which lumber is in very good condition, cut straight and has a good appearance. This is also called No. 1 grade.



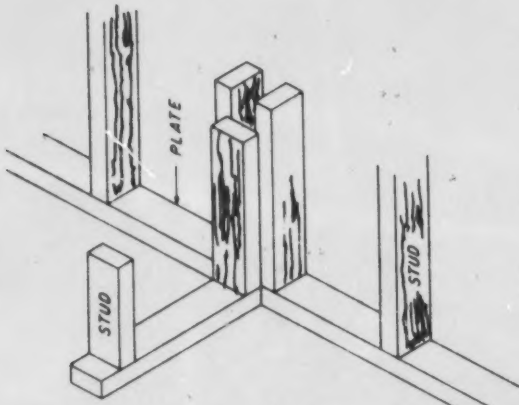
2. **Construction:** Grade of lumber used for general construction. This is also called No. 2 grade.



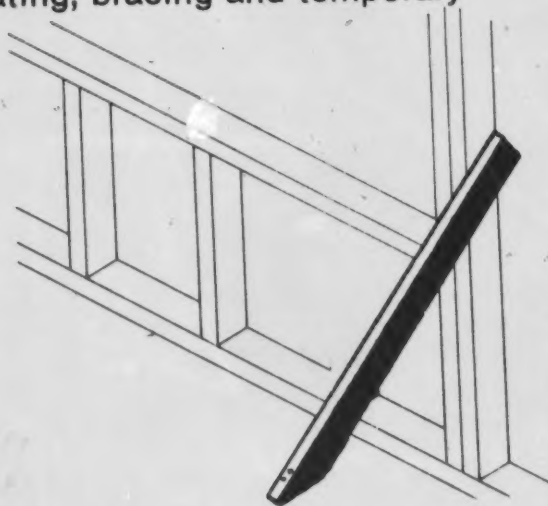
3. **Standard:** Lower quality grade also used for general construction. This is also called No. 3 grade.



4. **Utility:** Grade used for studding, blocking and plates where high quality is not required.



5. **Economy:** Grade used for crating, bracing and temporary construction.



# **NOTE!**

Plywood for carpentry use has a different grading system. This chart explains that system.

## **Grades of Plywood**

**N**

"Natural finish" veneer. Free of open defects. Allows some repairs.

**A**

Smooth and paintable. Neatly made repairs permissible. For natural finish in less demanding applications.

**B**

Solid surface veneer. Circular repair plugs and tight knots permitted.

**C**

Knotholes to 1". Limited splits. Minimum veneer permitted in exterior-type plywood.

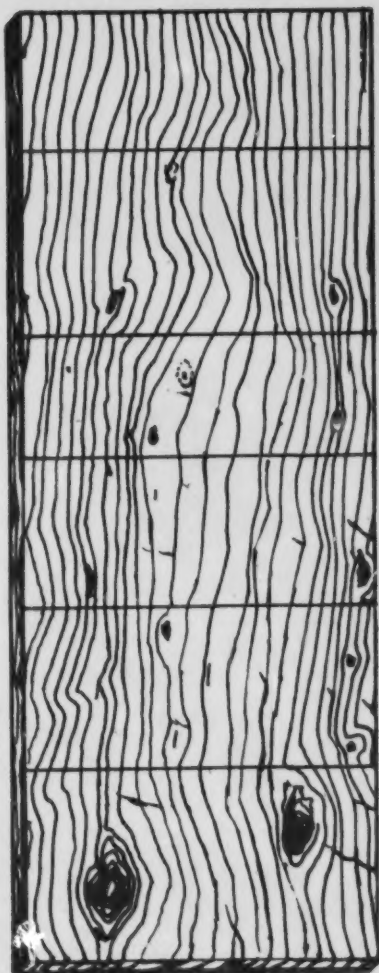
**C**

Plgd

Improved C veneer. Splits limited to 1/8". Knotholes limited to 1/4" x 1/2".

**D**

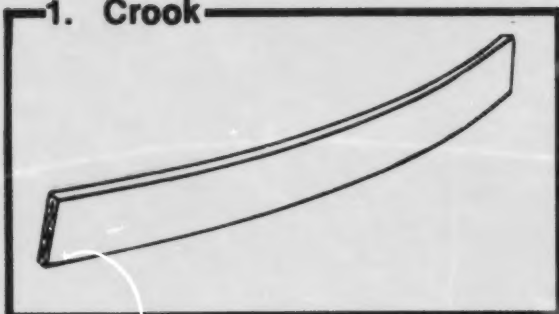
Permits knots and knotholes to 2 1/2" in width and 1/2" in length under certain limits. Limited splits permitted.



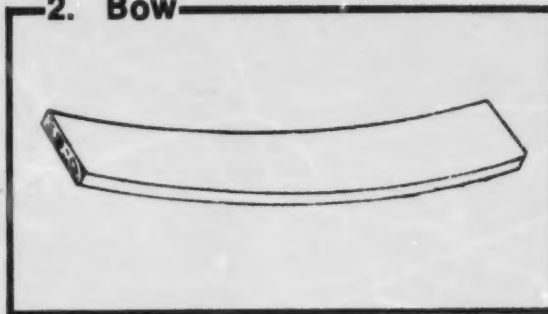
**TURN TO NEXT PAGE**

### C. Lumber Defects.

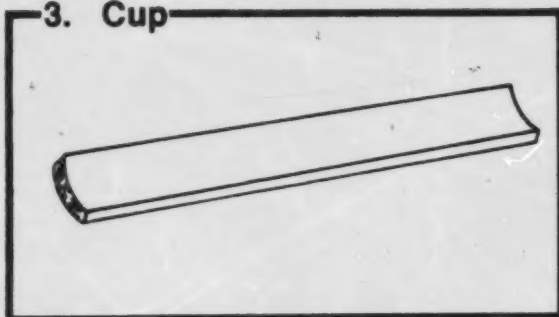
1. Crook



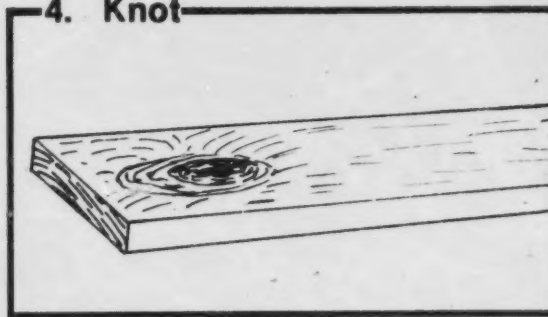
2. Bow



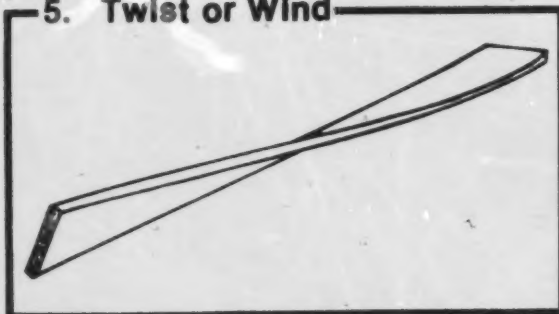
3. Cup



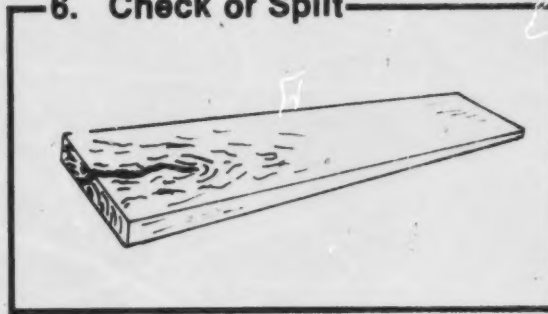
4. Knot



5. Twist or Wind



6. Check or Split



7. Knot Hole



8. Decayed



#### D. Lumber Specifications.

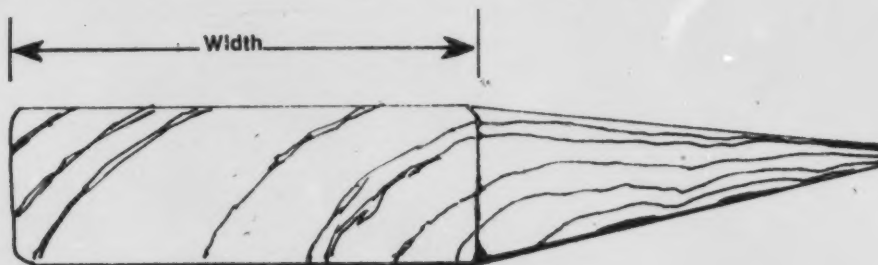
1. **Number of Pieces:** Amount of certain size lumber needed. Six pieces for instance.



2. **Thickness:** Measurement of how thick wood is, measured in whole inches. Two inches thick for instance.



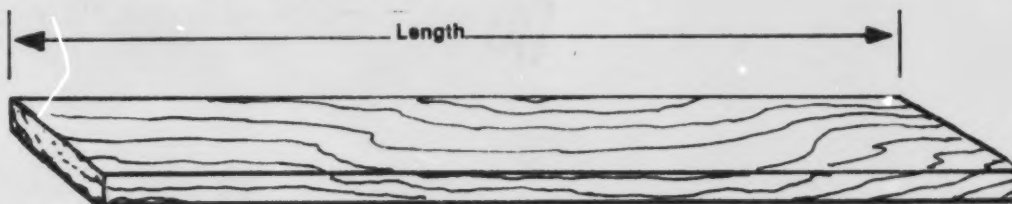
3. **Width:** Measurement of how wide wood is. Width is specified in even inches. Four inches wide for instance.



#### NOTE!

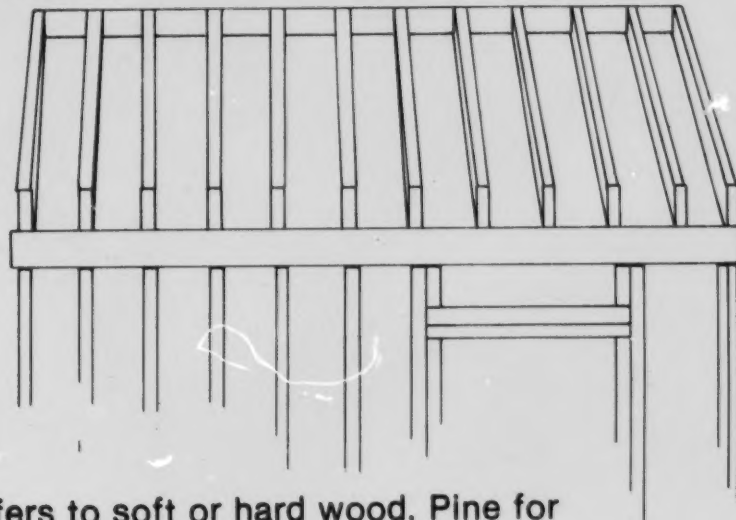
One-half inch and thicker is considered as the next full inch.  
Example:  $1\frac{1}{2}$ " x  $3\frac{3}{4}$ " is considered a 2" x 4".

4. **Length:** Measurement of lumber length. Length is specified in even feet. Eight feet long for instance.





5. **Grade:** Quality of lumber needed to complete certain tasks.  
A utility grade for instance.



6. **Kind of Lumber:** Refers to soft or hard wood. Pine for instance.



SOFT PINE



HARD OAK

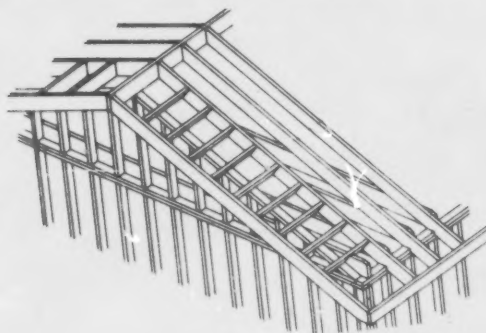
To order the above lumber, one would write:

6 - 2" x 4" x 8' UTILITY, PINE

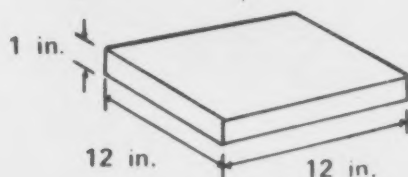
NUMBER OF PIECES    THICKNESS    WIDTH    LENGTH    GRADE    KIND

## 2. Board Foot Measurement

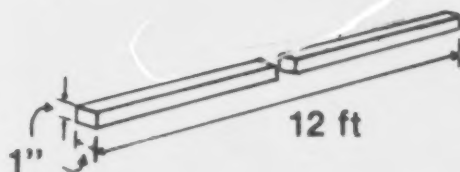
1. **Board Foot:** A board foot measurement is used for strip lumber, boards, dimensional lumber, and structural timber.



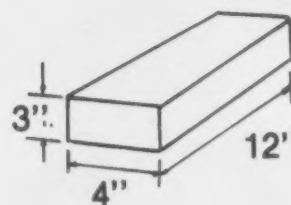
A **board foot** is lumber measurement equal to one foot square by one inch thick.



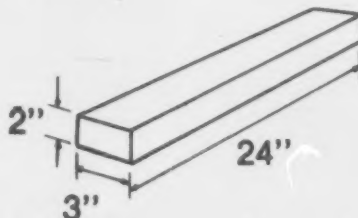
2. Each illustration is **one board foot** because they all equal one square foot one inch thick.



$12' \times 1" \times 1" = 1 \text{ board foot}$



$4" \times 3" \times 12" = 1 \text{ board foot}$



$2" \times 3" \times 24" = 1 \text{ board foot}$

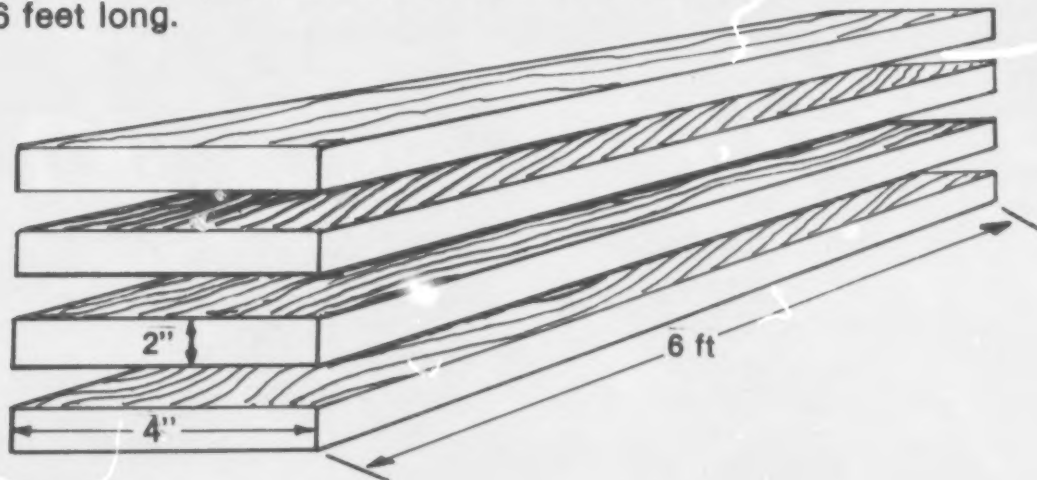
3. A board foot is 1 inch thick, 12 inches wide and 1 foot long.  
Use that to make a formula to figure board feet.

$$\begin{array}{ccccccc} \text{NUMBER OF} & & \text{THICKNESS} & & \text{WIDTH} & & \text{LENGTH} \\ \text{PIECES NEEDED} & & \text{IN INCHES} & & \text{IN INCHES} & & \text{IN FEET} \\ 1 & \times & 1'' & \times & 12'' & \times & 1' \\ \hline & & 12 & & & & \end{array} = 1 \text{ BOARD FOOT}$$

4. Try figuring board feet for the lumber specifications you saw earlier.

$$\begin{array}{ccccccc} \text{NUMBER OF} & & \text{THICKNESS} & & \text{WIDTH} & & \text{LENGTH} \\ \text{PIECES NEEDED} & & \text{IN INCHES} & & \text{IN INCHES} & & \text{IN FEET} \\ 16 & \times & 2'' & \times & 4'' & \times & 8' \\ \hline & & 12 & & & & \end{array} = 32 \text{ BOARD FEET}$$

5. Try this one yourself. Say you need 4 pieces of 2"x 6" lumber, 6 feet long.

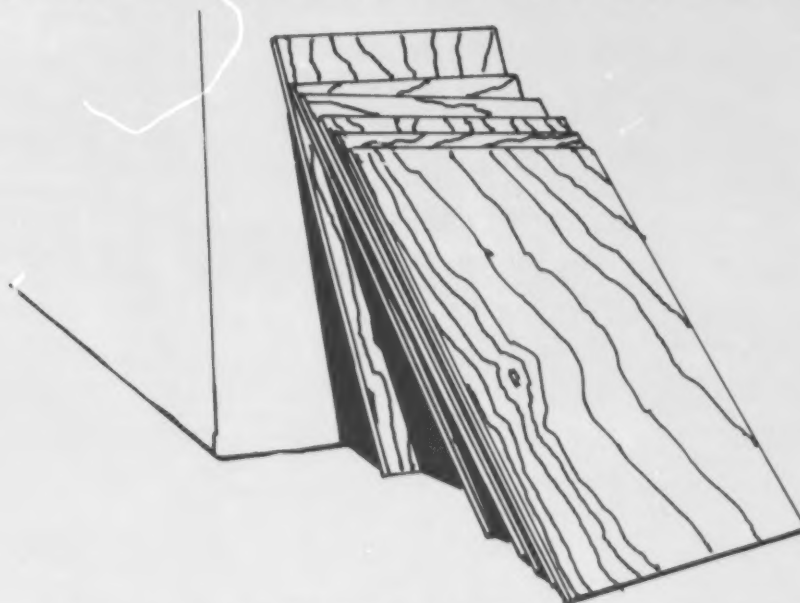


Formula?

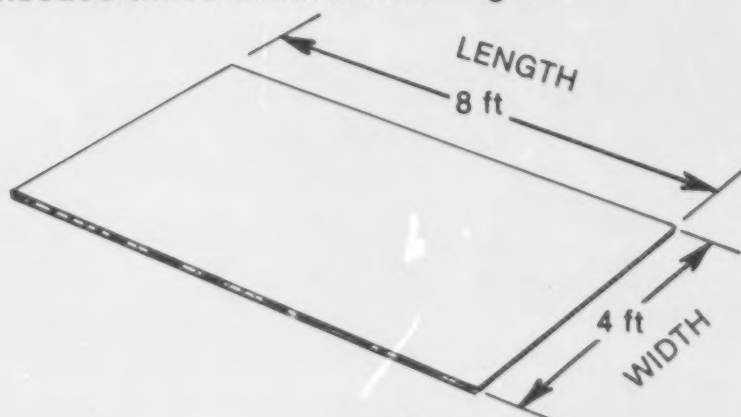
\_\_\_\_\_ =

## F. Square Foot Measurement

1. **Square Foot:** Square foot measurement is used for plywood, particle board, hard board and wood paneling.



Square foot measurement is figured by multiplying the number of pieces needed times width times length.

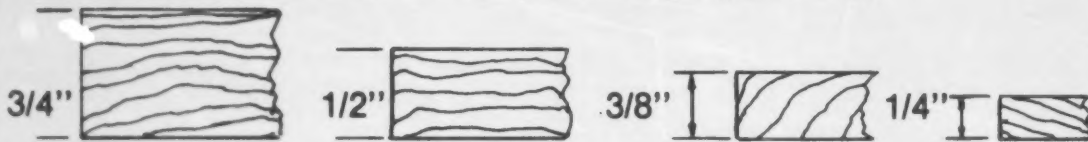


2. The formula for figuring square feet is:

$$\begin{array}{ccccccc} \text{NUMBER OF} & & & & & & \\ \text{PIECES} & & & & & & \\ 1 & \times & 4' & \times & 8' & = & 32 \text{ SQUARE FEET} \\ & & \text{WIDTH} & & \text{LENGTH} & & \\ & & \text{IN FEET} & & \text{IN FEET} & & \end{array}$$

**NOTE!**

Thickness is not used when measuring square feet.



3. How much square feet of coverage would you have with 5 sheets of  $\frac{3}{4}$ " x 4' x 8' C grade plywood?

NUMBER OF  
PIECES

WIDTH  
IN FEET

LENGTH  
IN FEET

\_\_\_\_\_ X \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_ SQUARE FEET

**TURN TO NEXT PAGE**



## Unit 5 Lumber Selection and Measurement

### Materials Identification Exercise

Student's Name: \_\_\_\_\_

Match the picture with its correct name.

\_\_\_\_\_ A. Twist

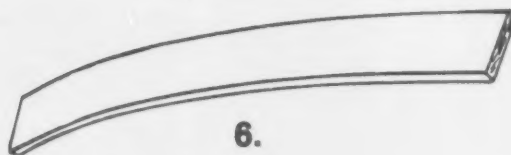
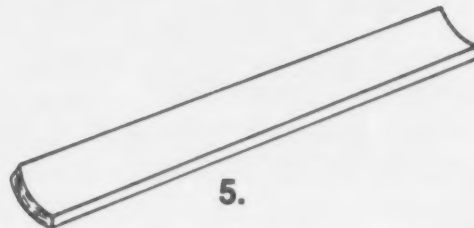
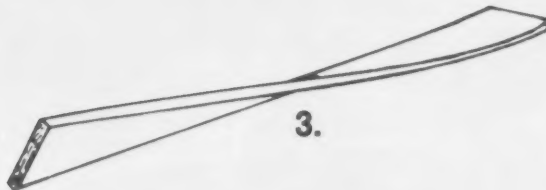
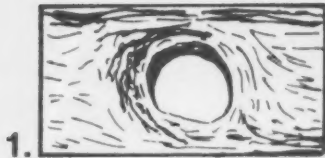
\_\_\_\_\_ B. Cup

\_\_\_\_\_ C. Bow

\_\_\_\_\_ D. Crook

\_\_\_\_\_ E. Decayed

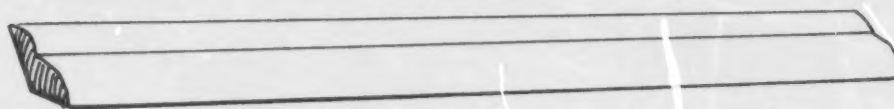
\_\_\_\_\_ F. Knot Hole



73

### G. Lineal Foot Measurement.

1. **Lineal Foot:** Lineal foot measurement is used for trim and moldings, and other construction material.



**Lineal foot measurement** is figured by length measurement only.



2. If this molding is 80 cents per foot, how much would 12 feet of molding cost a house builder?

NUMBER OF  
FEET

COST PER  
FOOT

\_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_



## Unit 5 Lumber Selection and Measurement

### Materials Identification Exercise

Student's Name: \_\_\_\_\_

Match the picture with its correct name.

\_\_\_\_\_ A. Twist

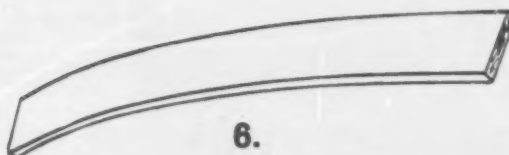
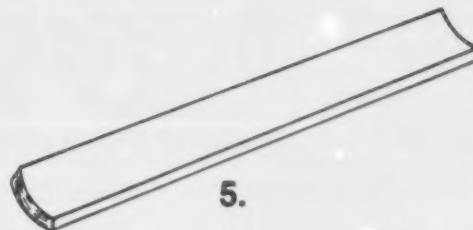
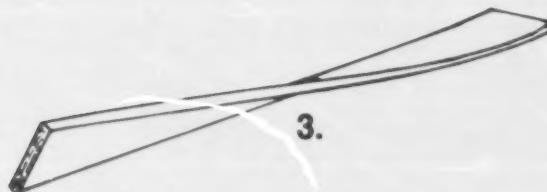
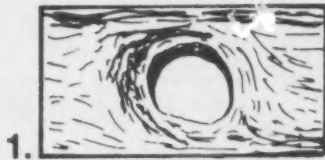
\_\_\_\_\_ D. Crook

\_\_\_\_\_ B. Cup

\_\_\_\_\_ E. Decayed

\_\_\_\_\_ C. Bow

\_\_\_\_\_ F. Knot Hole



# Unit 5 Lumber Selection and Measurement

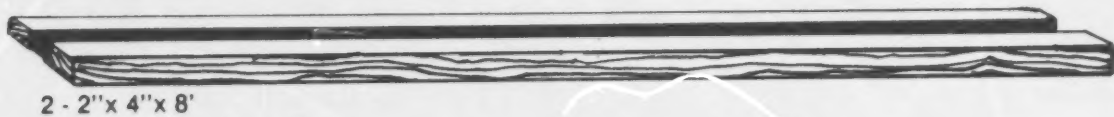
## Lumber Measurement Exercise.

Student's Name: \_\_\_\_\_

1. Figure board feet for the following lumber.

A.    NUMBER OF    THICKNESS    WIDTH IN    LENGTH IN  
         PIECES       IN INCHES    INCHES       FEET

\_\_\_\_\_ × \_\_\_\_\_ × \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ BOARD FEET



B.    NUMBER OF    THICKNESS    WIDTH IN    LENGTH IN  
         PIECES       IN INCHES    INCHES       FEET

\_\_\_\_\_ × \_\_\_\_\_ × \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ BOARD FEET



C.    NUMBER OF    THICKNESS    WIDTH IN    LENGTH IN  
         PIECES       IN INCHES    INCHES       FEET

\_\_\_\_\_ × \_\_\_\_\_ × \_\_\_\_\_ × \_\_\_\_\_ = \_\_\_\_\_ BOARD FEET



## Unit 5 Lumber Selection and Measurement

### Practical Exercise Performance Checklist

The student \_\_\_\_\_ successfully performed the following tasks:

| Tasks                                          | Yes | No | Comments |
|------------------------------------------------|-----|----|----------|
| 1. Recognized a softwood                       |     |    |          |
| 2. Recognized a hardwood                       |     |    |          |
| 3. Understood different grades of lumber       |     |    |          |
| 4. Recognized and identified defects in lumber |     |    |          |
| 5. Understood lumber specifications            |     |    |          |
| 6. Understood board foot measurement           |     |    |          |
| 7. Was able to figure board feet               |     |    |          |
| 8. Understood square foot measurement          |     |    |          |
| 9. Was able to figure square feet              |     |    |          |
| 10. Understood lineal foot measurement         |     |    |          |
| 11. Was able to figure lineal feet             |     |    |          |

Satisfactory Performance ☐

Repeat Exercise ☐

Should Move On ☐

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date



Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 6**

**Cutting With Handsaws**

## Unit 6

### Cutting With Handsaws

#### Cutting With Handsaws

After you study this lesson, you should be able to:

1. Identify tools and materials used in cutting with handsaws.
2. Demonstrate the ability to:
  - Cut lumber to length using a crosscut handsaw.
  - Rip lumber to width using a rip handsaw.

#### Show What You Can Do.

Check the statement that fits you best.

1.

☐

I can do all the tasks above and want my instructor to check me through the Practical Exercise Performance Checklist.



**SEE YOUR INSTRUCTOR**

2.

☐

I want to study the information in this unit before I do the Practical Exercise Performance Checklist.



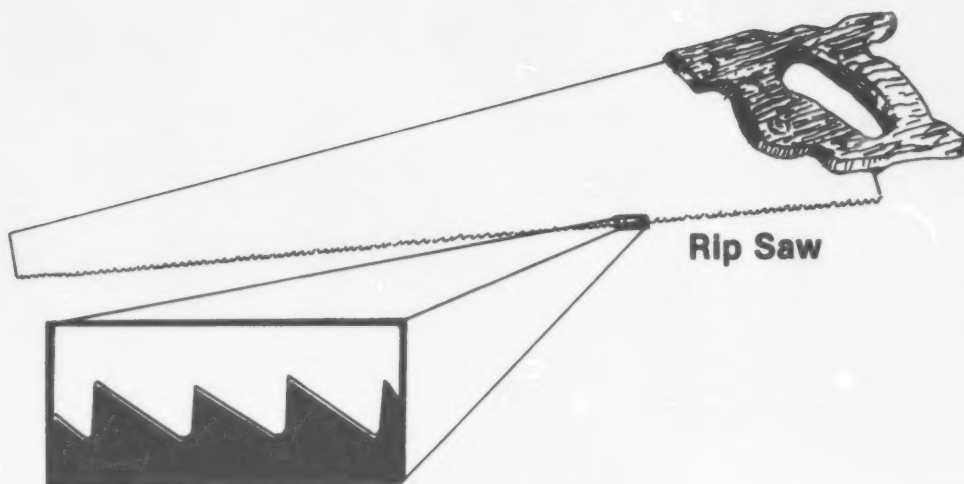
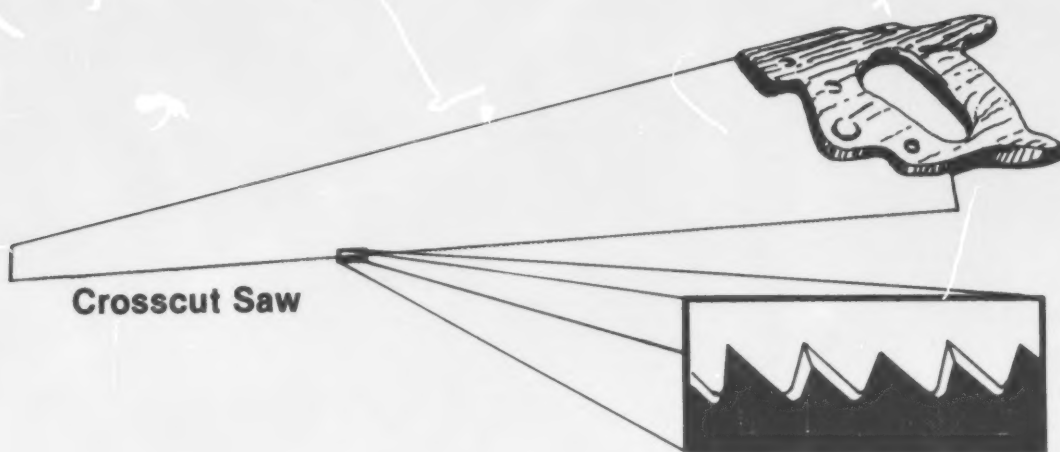
**TURN THE PAGE AND BEGIN**

## Unit 6

### Cutting With Handsaws

#### Introduction

Handsaws are the most common tool used to cut wood. A crosscut saw is used to cut wood across the grain. A rip saw is used for ripping a board lengthwise with the grain. This unit covers proper procedures for using handsaws.



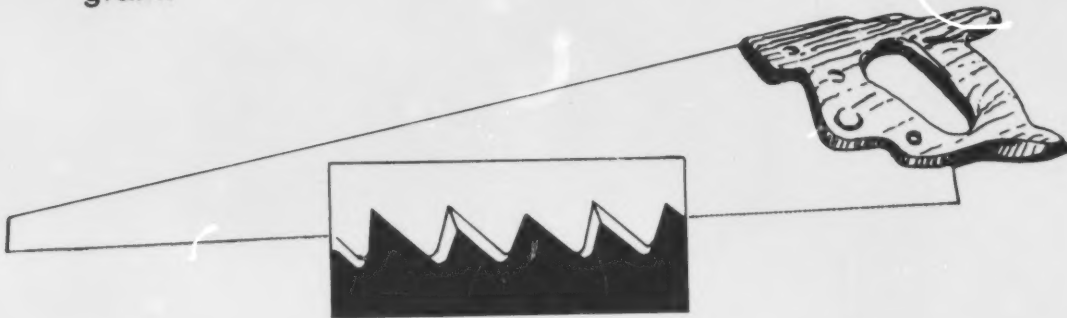
**TURN TO NEXT PAGE**

## Unit 6

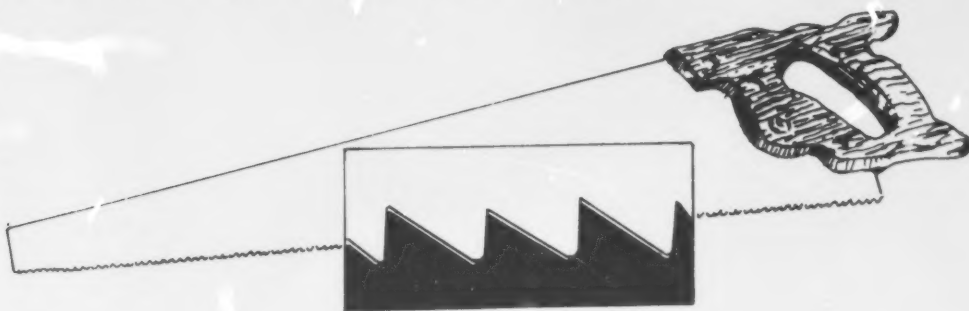
### Cutting With Handsaws

#### A. Tools, Materials and Equipment for Cutting with Handsaws

1. **CROSSCUT SAW:** Used to cut lumber to proper length across grain.



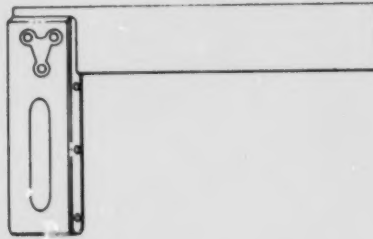
2. **RIP SAW:** Used to cut wood to the proper width.



3. **TAPE RULER:** Used to measure length or width of stock.



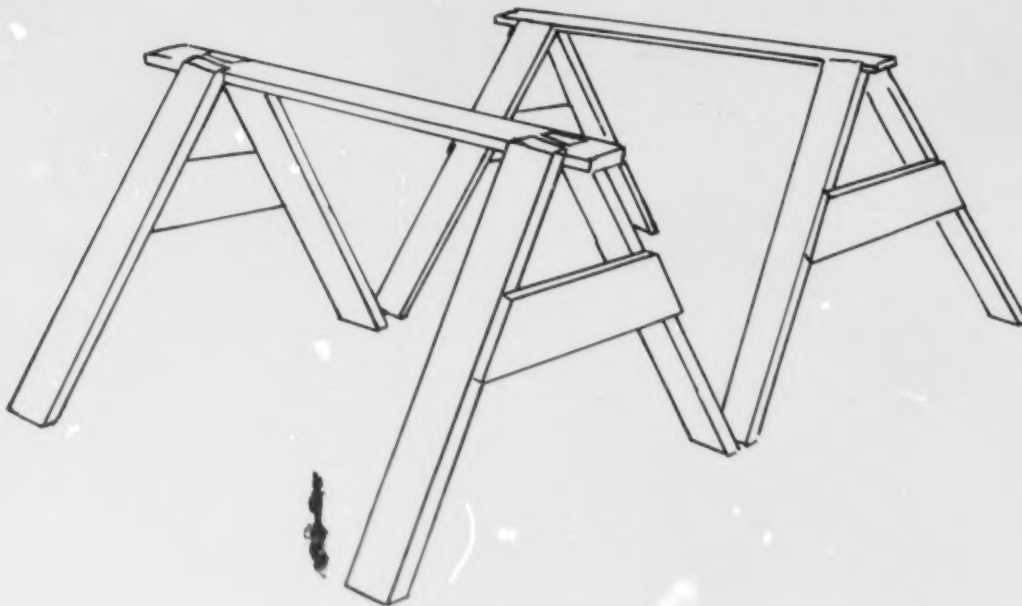
4. **TRY SQUARE:** Used to mark cutting line on lumber.



5. **PENCIL:** Used in marking lines to be cut.

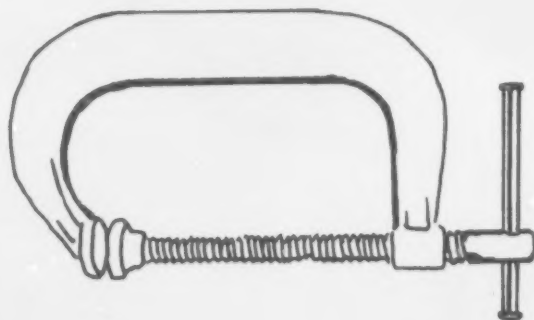


6. **SAW HORSES:** Used to support lumber when sawing.





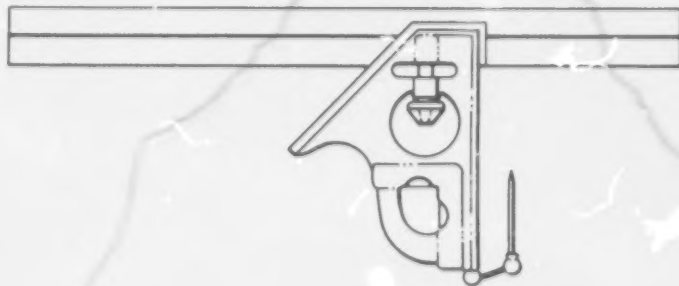
7. **C-CLAMPS:** Used to hold wood to be cut.



8. **PROTECTIVE CLOTHING:** Used as protection from carpentry shop accidents.



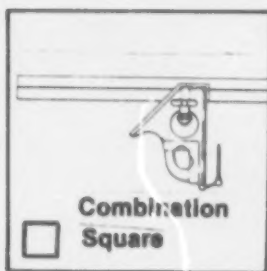
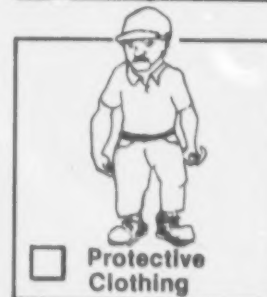
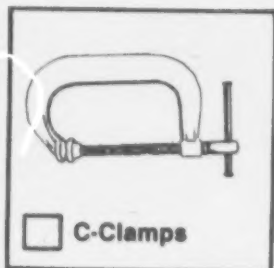
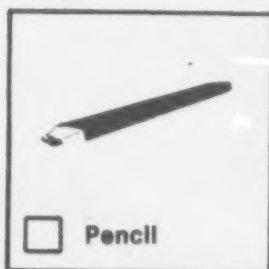
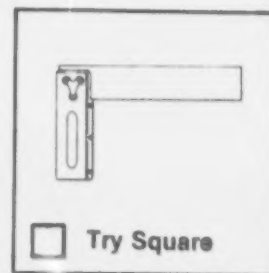
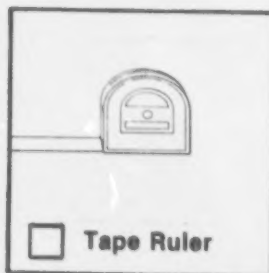
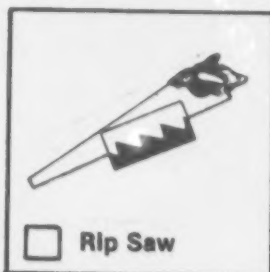
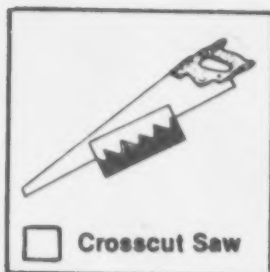
9. **COMBINATION SQUARE:** Used to gauge a line parallel to the edge of a board.



**TURN TO NEXT PAGE**

## B. Steps In Cutting Wood with Handsaws.

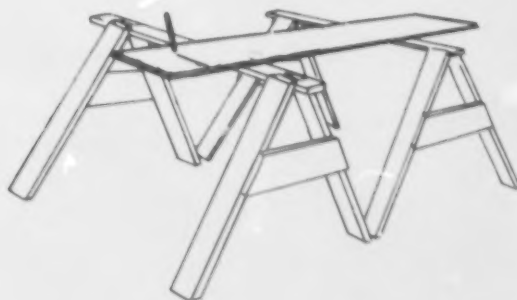
1. Find and Check Off the following:



2. Wear protective clothing.



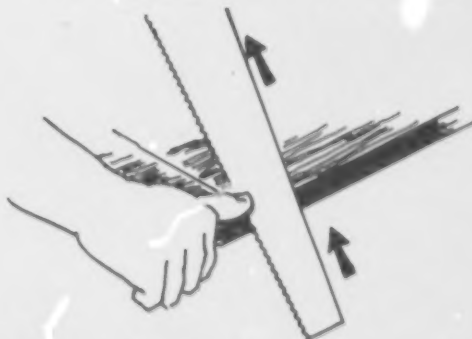
3. Place lumber on the saw horses and mark where the cut is to be made.



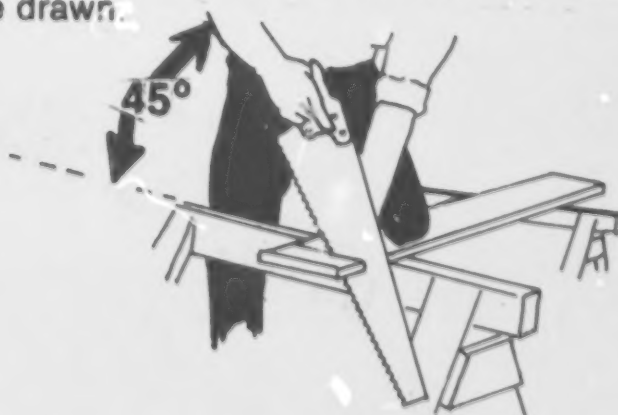
**NOTE!**

Always mark on the waste side of the wood piece.

4. Place your thumb against the side of the saw blade. Pull the saw slowly backward to begin your cut.

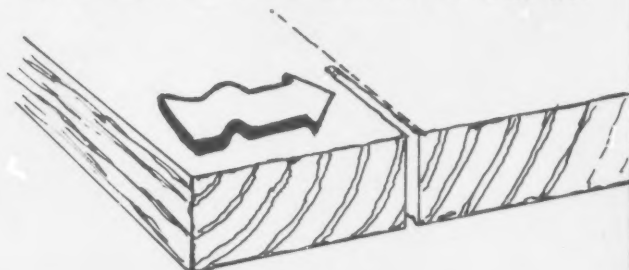


5. Use long, smooth forward and backward strokes to cut. Follow the line drawn.



## NOTE!

The cut made by a saw is called a kerf.  
The blade should be on the side of the line that will be cut off  
and held at a 45° angle.



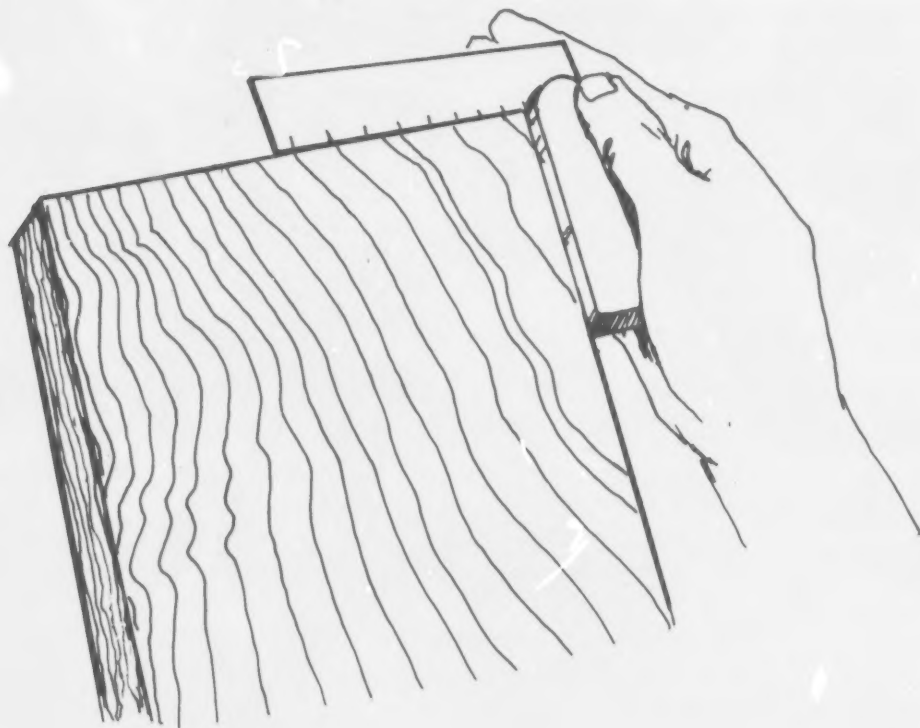
6. Use a twisting motion to bring the saw back to the cutting line if it starts to wander.



7. Use your hand to support the end being cut.



8. Use a try square to check your cut.

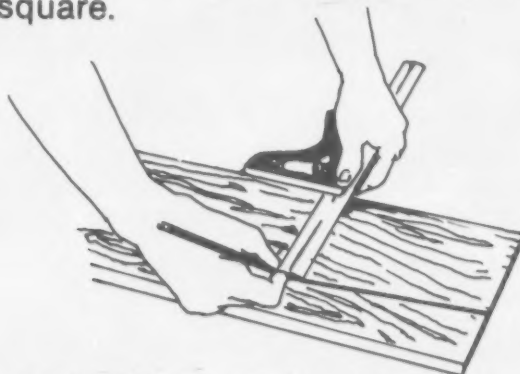


**TURN TO NEXT PAGE**

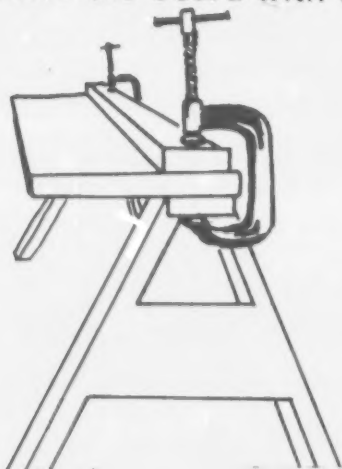


### C. Steps In Cutting Wood with the Rip Saw.

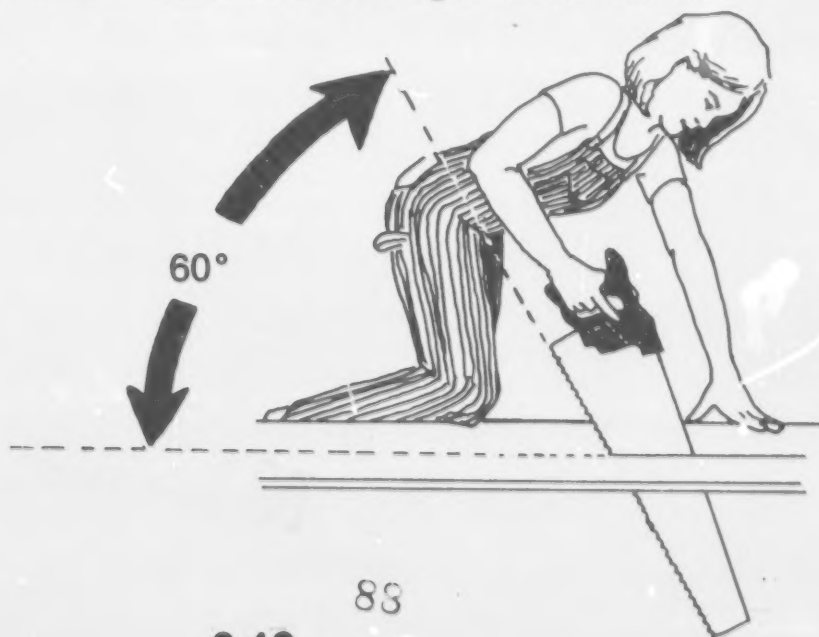
9. Draw a line along the board you are going to cut using the combination square.



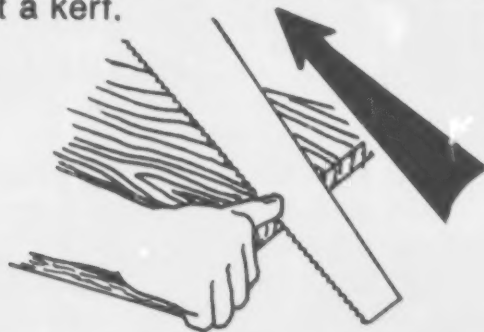
10. Secure the board with two C-Clamps to the saw horses.



11. Position the rip saw blade at a 60° angle to the board.



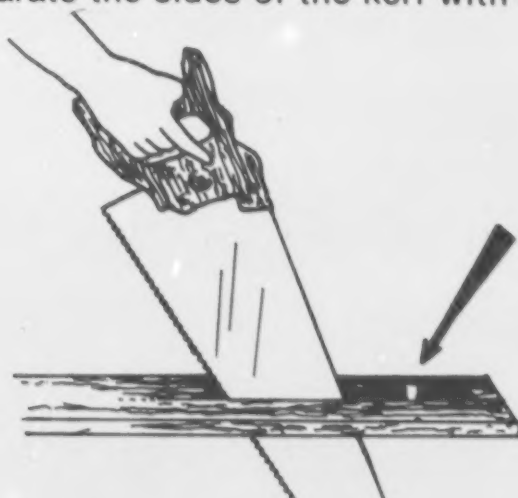
12. Place your thumb against the saw blade and pull saw slowly backward to start a kerf.



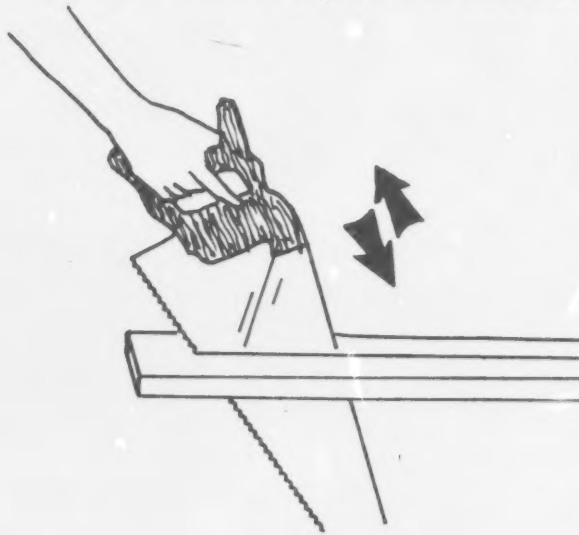
13. When kerf is formed, apply more pressure on downward stroke and less on the upward stroke.



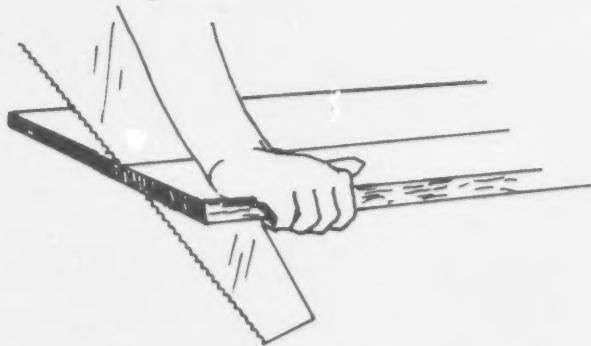
14. Separate the sides of the kerf with a small wedge.



15. Make short, slow strokes when you are about to complete the cut.



16. Support waste portion of the board and complete the cut. This will prevent the wood from splitting.



17. Clean work area and return tools to their proper places.

**SEE YOUR INSTRUCTOR**

## Unit 6 Cutting with Handsaws

### Practical Exercise Performance Checklist

The student \_\_\_\_\_ successfully performed the following tasks:

| Tasks                                                                | Yes | No | Comments |
|----------------------------------------------------------------------|-----|----|----------|
| 1. Identified:                                                       |     |    |          |
| a. Crosscut Saw                                                      |     |    |          |
| b. Rip Saw                                                           |     |    |          |
| c. Tape Ruler                                                        |     |    |          |
| d. Try Square                                                        |     |    |          |
| e. Pencil                                                            |     |    |          |
| f. C-Clamps                                                          |     |    |          |
| g. Saw Horses                                                        |     |    |          |
| h. Protective Clothing                                               |     |    |          |
| i. Combination Square                                                |     |    |          |
| 2. Wore protective clothing                                          |     |    |          |
| 3. Properly placed lumber on saw horses and marked                   |     |    |          |
| 4. Placed thumb against side of blade while pulling saw backward     |     |    |          |
| 5. Used long, smooth forward and backward strokes                    |     |    |          |
| 6. Used a twisting motion to bring saw back to line when it wandered |     |    |          |
| 7. Used hand to support end being cut                                |     |    |          |
| 8. Used a try square to check cut                                    |     |    |          |
| 9. Used the combination square to draw a line                        |     |    |          |
| 10. Secured the board to the saw horse with C-Clamps                 |     |    |          |
| 11. Positioned the rip saw blade at a 60° angle                      |     |    |          |

| Tasks                                                                         | Yes | No | Comments |
|-------------------------------------------------------------------------------|-----|----|----------|
| 12. Placed thumb against saw blade and pulled backward to start a kerf        |     |    |          |
| 13. Applied more pressure on downward stroke of saw and less on upward stroke |     |    |          |
| 14. Separated the sides of the kerf with a wedge                              |     |    |          |
| 15. Made short slow strokes when completing the cut                           |     |    |          |
| 16. Supported the portion of the board being cut                              |     |    |          |
| 17. Cleaned work area and returned tools to their proper places               |     |    |          |

Satisfactory Performance ☐

Should Move On ☐

Repeat Exercise ☐

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date



Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 7**

**Uses of Nails  
and  
Nail Hammers**

## Unit 7

### Uses of Nails and Nail Hammers

#### Uses of Nails and Nail Hammers

After you study this lesson, you should be able to:

1. Identify tools and materials used to drive and pull nails.
2. Drive a nail into stock without bending the nail.
3. Pull a nail out of stock without breaking the nail.

#### Show What You Can Do.

Check the statement that fits you best.

1.

☐

I can do all the tasks above and want my instructor to check me through the Practical Exercise Performance Checklist.



**SEE YOUR INSTRUCTOR**

2.

☐

I want to study the information in this unit before I do the Practical Exercise Performance Checklist.



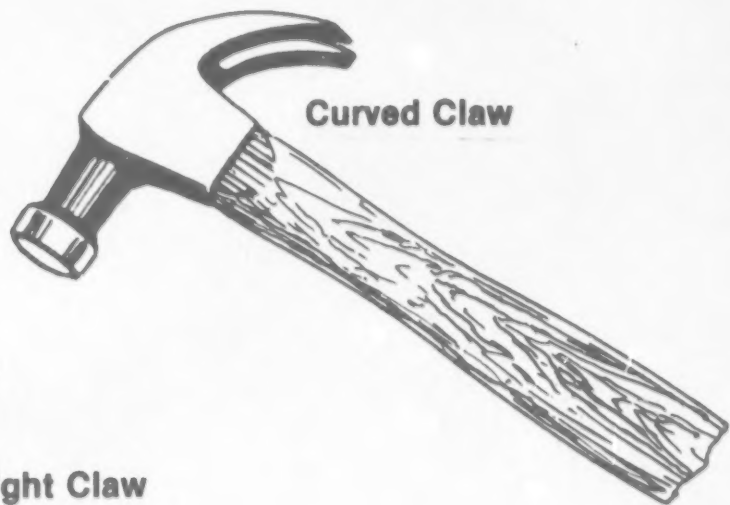
**TURN THE PAGE AND BEGIN**

## Unit 7

### Uses of Nails and Nail Hammers

#### Introduction

A nail hammer is one of the most important hand tools used in carpentry work. It is used to drive and pull nails during construction work. You will be using two types of nail hammers: 1) Curved Claw and 2) Straight Claw.



In this unit you will learn how to identify hammers and nails and to properly drive nails.

**TURN TO NEXT PAGE**<sub>95</sub>

## Unit 7

### Uses of Nails and Nail Hammers

#### A. Tools, Materials and Equipment for Uses with Nails and Nail Hammers.

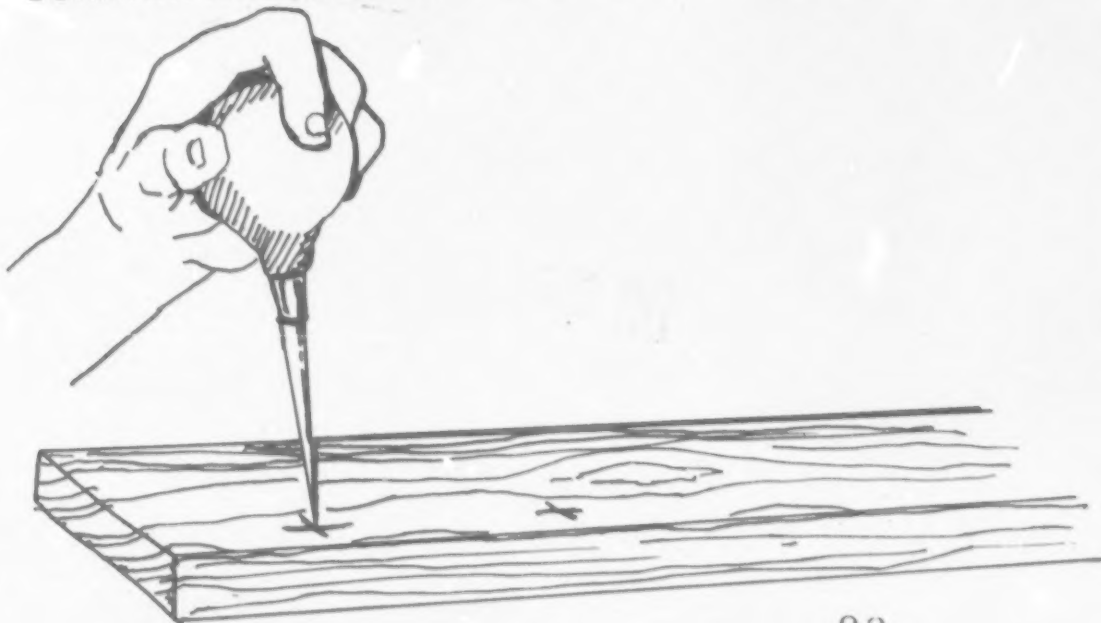
1. **CURVED CLAW HAMMER:** Used to drive and pull nails.



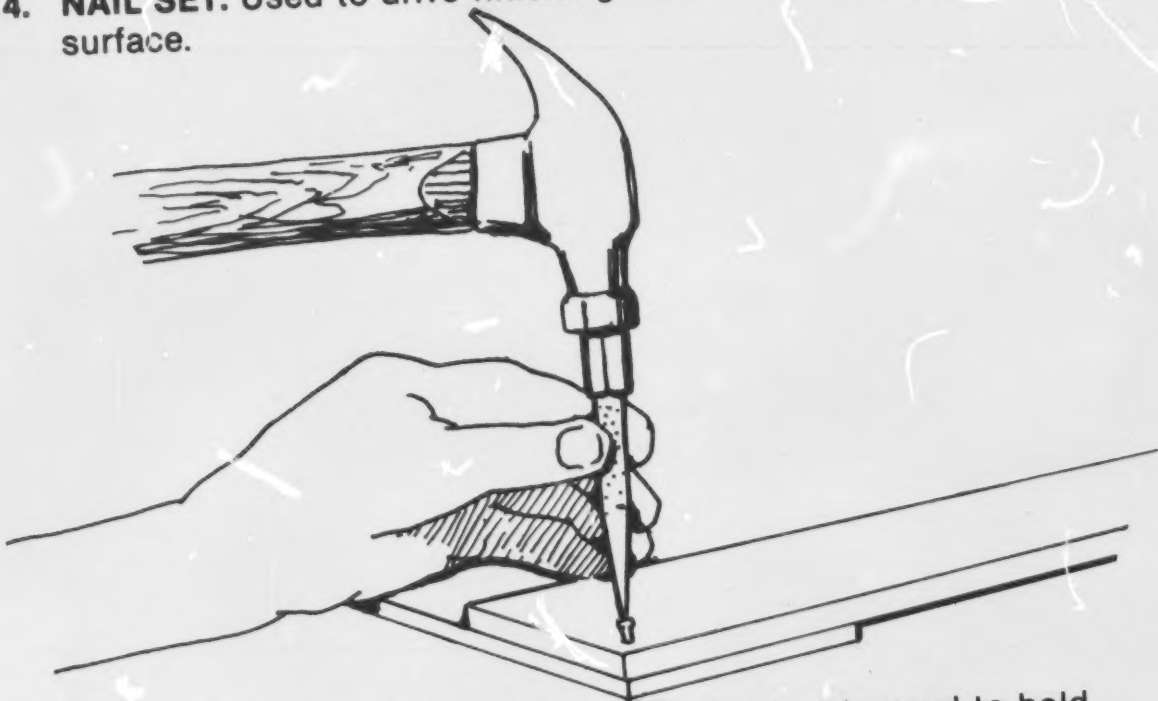
2. **STRAIGHT CLAW HAMMER:** Used to rip apart or tear down wooden structures.



3. **SCRATCH AWL:** Used to mark location to drive nail into wood.



4. **NAIL SET:** Used to drive finishing nails or brads below wood surface.



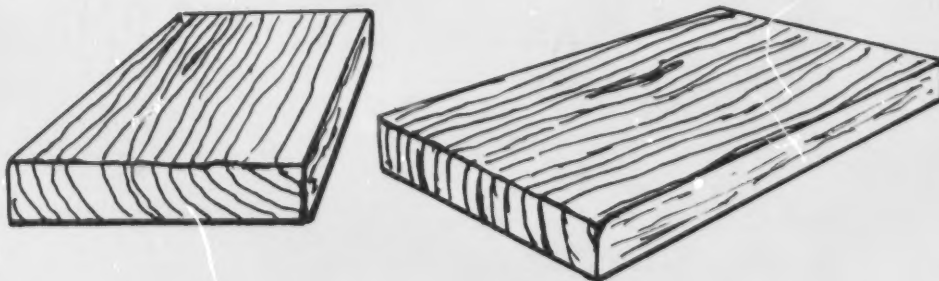
5. **COMMON NAILS:** Nails having wide, flat heads used to hold pieces of wood together.



6. **FINISHING NAILS:** Nails having small heads used to hold pieces of wood together for finished appearance.



7. **SIX INCH LONG WOOD PIECES (2):** 1"x 4" pieces used for driving nails.

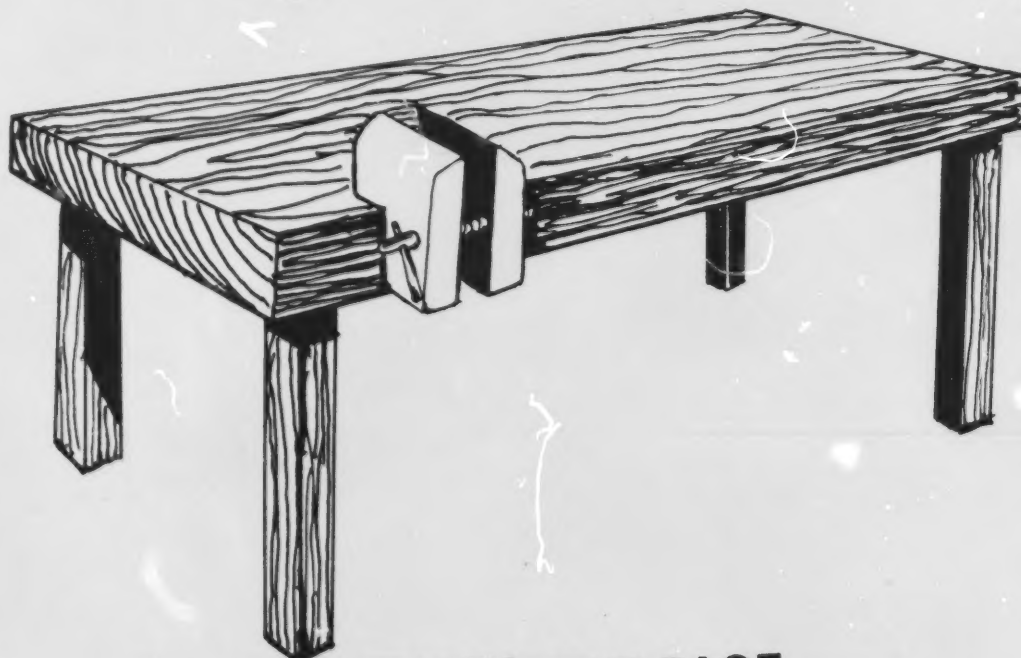




8. **SAFETY EQUIPMENT:** Goggles, apron and hat used for protection against injury and dirt.



9. **WORK BENCH WITH VISE:** Used to hold materials.



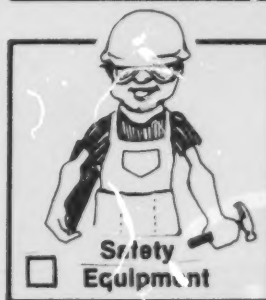
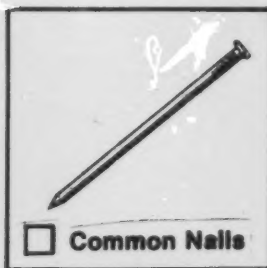
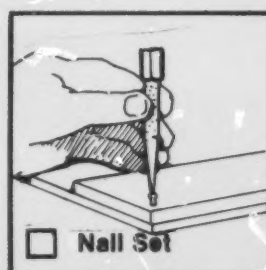
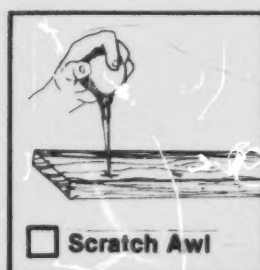
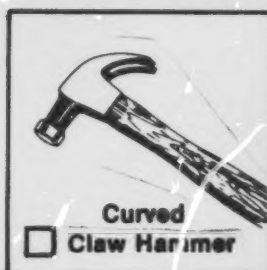
**TURN TO NEXT PAGE**

## Unit 7

### Uses of Nails and Nail Hammers

#### B. Steps for Using Nails and Nail Hammers.

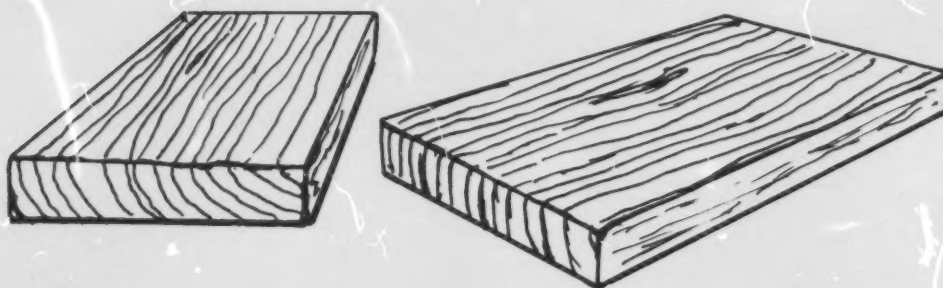
##### 1. Find and Check Off the Following:



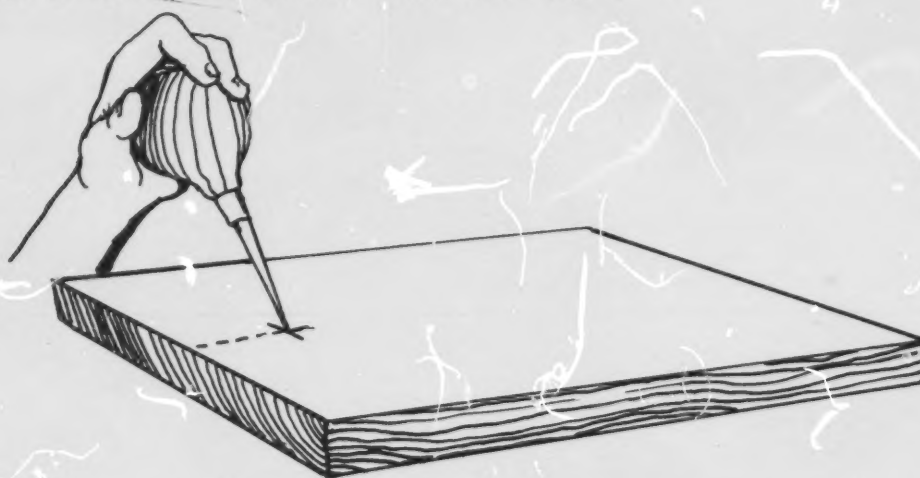
##### 2. Wear Proper Safety Equipment.



3. Obtain two pieces of wood. Inspect them for cracks or knots.



4. Lay wood pieces on work bench. Mark nail position in the center or at least one inch from the edge.



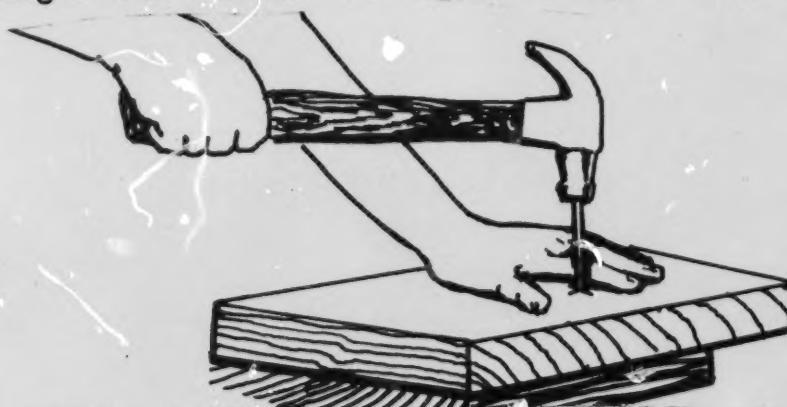
5. Grasp hammer handle near its end.



6. Hold nail between thumb and forefinger. Place nail on awl mark. Point it in direction you want to drive it.



7. Tap nail squarely and lightly with hammer. Support nail with your finger until it enters wood deep enough to stand on its own.



8. Remove fingers and finish driving nail into the wood.



9. Pull out nails using the claw end of hammer.

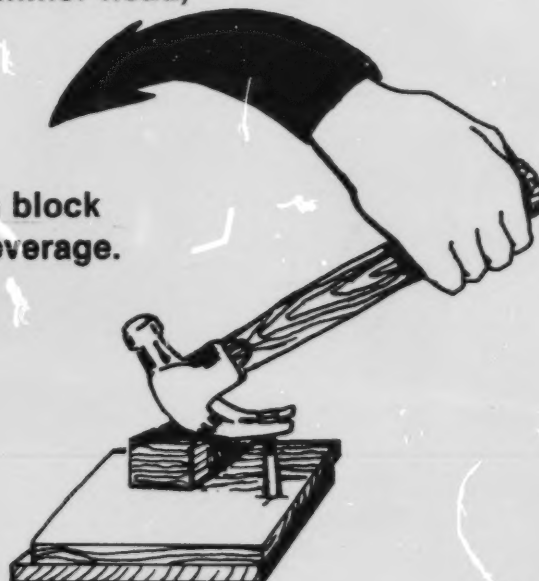
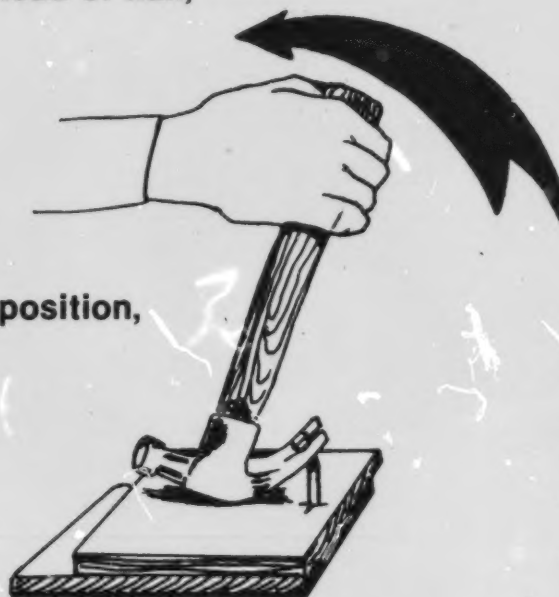
**NOTE!**

If nail head is above wood surface,  
slip claw hammer under head of nail,

raise handle to a vertical position,

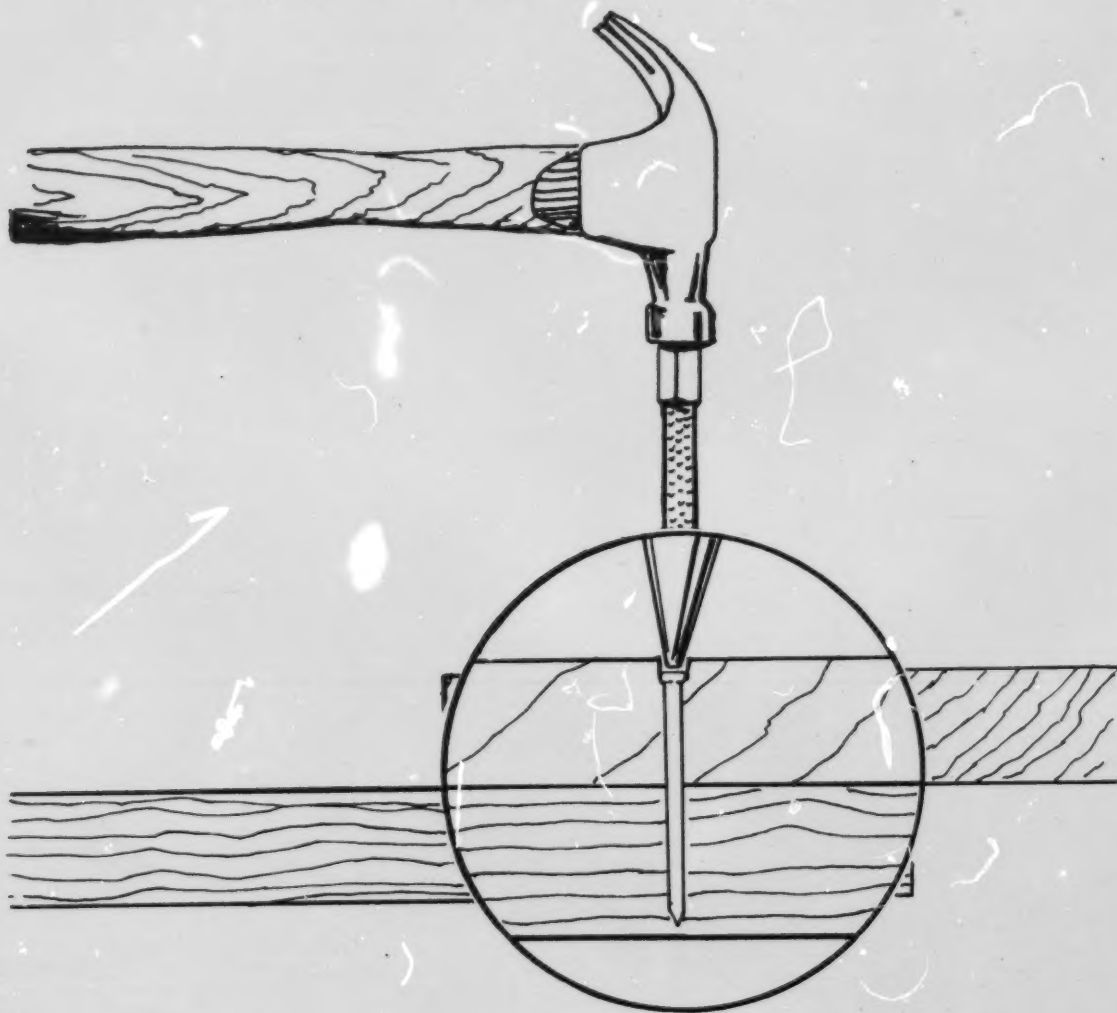
slip wooden block under hammer head,

and pull nail with wooden block  
using wooden block for leverage.





10. When driving a finishing nail, use nail set to drive head about  $\frac{1}{16}$ " below surface of wood.



11. Clean your work area and return tools to their proper places.

**TURN TO NEXT PAGE**

# Unit 7

## Uses of Nails and Nail Hammers

### Practical Exercise Performance Checklist

The student \_\_\_\_\_ successfully performed the following tasks:

| Tasks                                                        | Yes | No | Comments |
|--------------------------------------------------------------|-----|----|----------|
| 1. Identified:                                               |     |    |          |
| a. Curved Claw Hammer                                        |     |    |          |
| b. Straight Claw Hammer                                      |     |    |          |
| c. Scratch Awl                                               |     |    |          |
| d. Nail Set                                                  |     |    |          |
| e. Common Nails                                              |     |    |          |
| f. Finishing Nails                                           |     |    |          |
| 2. Wore proper safety equipment                              |     |    |          |
| 3. Obtained and inspected wood                               |     |    |          |
| 4. Marked nail position on wood                              |     |    |          |
| 5. Grasped hammer near end                                   |     |    |          |
| 6. Correctly held nail on awl mark                           |     |    |          |
| 7. Held nail with fingers and tapped it                      |     |    |          |
| 8. Finished driving nail into wood                           |     |    |          |
| 9. Pulled common nails with hammer                           |     |    |          |
| 10. Used nail set to drive finishing nail head below surface |     |    |          |
| 11. Cleaned work area and returned tools                     |     |    |          |

Satisfactory Performance ☐

Repeat Exercise ☐

Should Move On ☐

Instructor's Signature

Date

104

Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 8**

**Using a Hand Plane**

## Unit 8 Using a Hand Plane

### Using a Hand Plane

After you study this lesson, you should be able to:

1. Identify parts of a hand plane.
2. Demonstrate ability to use a hand plane safely and according to recommended use.
3. Demonstrate ability to properly adjust a hand plane.

### Show What You Can Do

Check the statement that fits you best.

1. ☐ I can do all the tasks above and want my instructor to give me the Practical Exercise.



**SEE YOUR INSTRUCTOR**

2. ☐ I want to study the information in this unit before I do the Practical Exercise

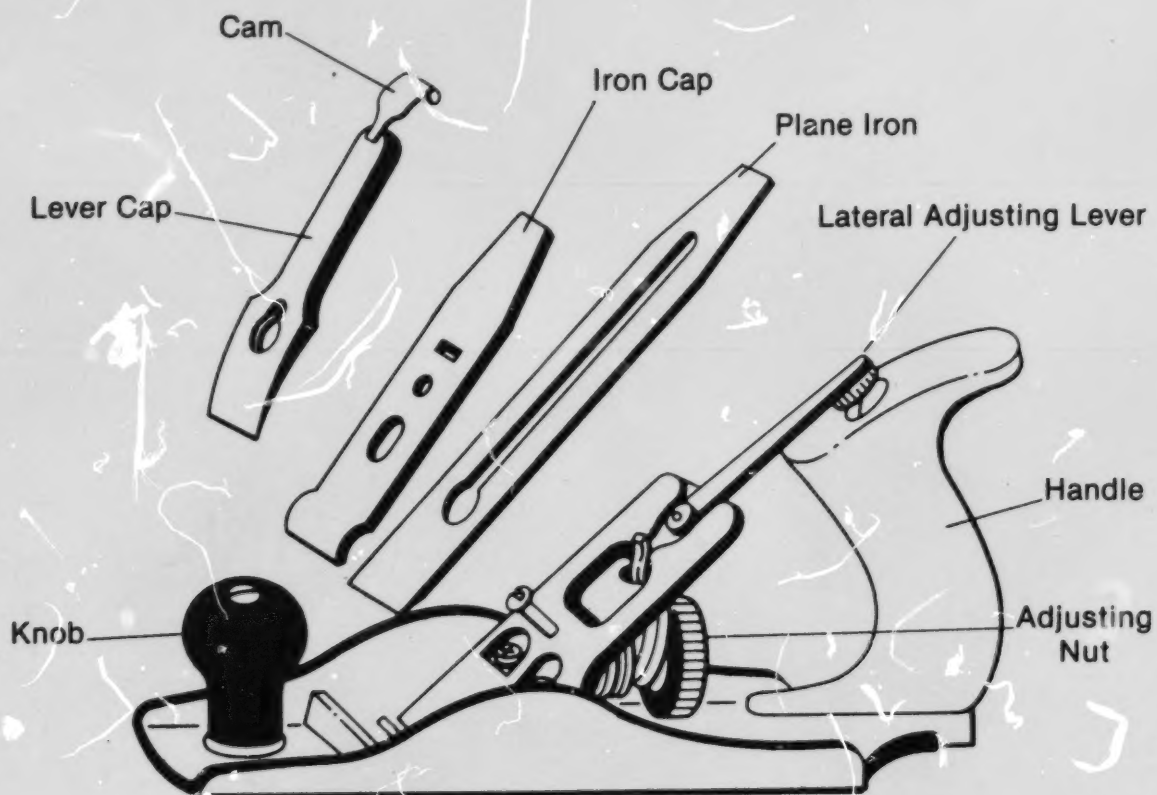


**TURN THE PAGE AND BEGIN**

## Unit 8 Using a Hand Plane

### Introduction

Carpentry work includes many finishing operations in which materials must be smoothed, beveled or trimmed. A good craftsman must know how to properly use hand tools. In this unit you will learn how to use and identify parts of a hand plane.



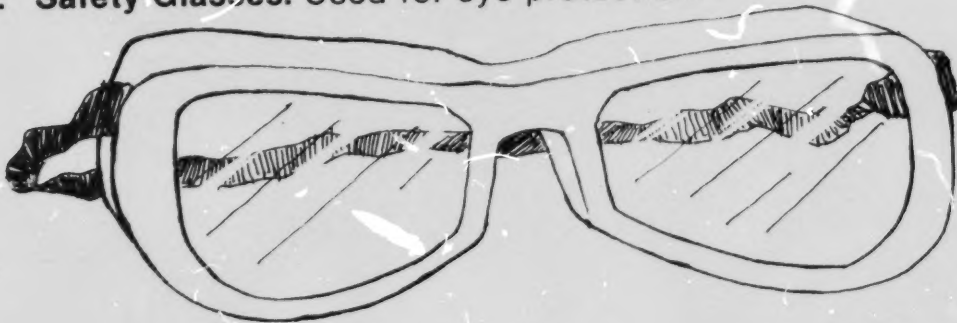
**TURN TO NEXT PAGE**



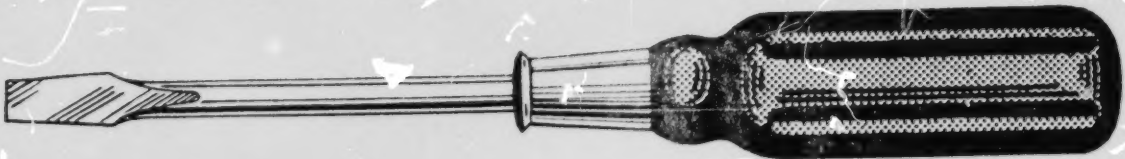
## Unit 8 Using a Hand Plane

### A. Tools, Materials and Equipment for Using a Hand Plane.

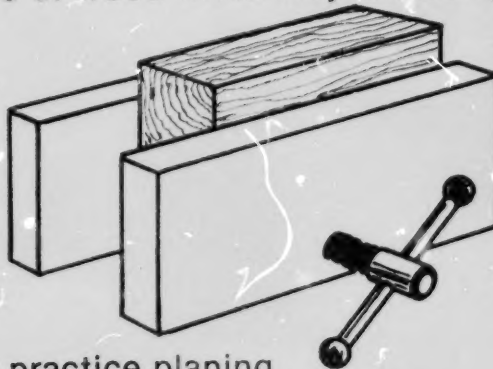
1. **Safety Glasses:** Used for eye protection.



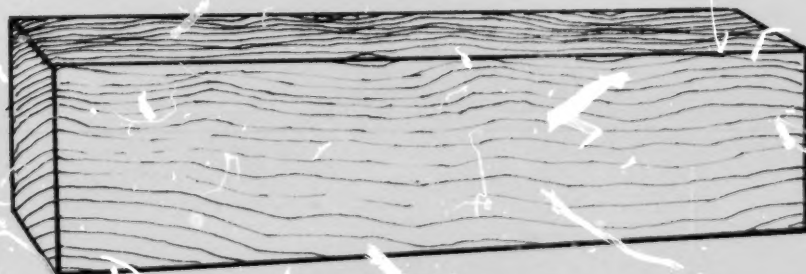
2. **Standard Screwdriver:** Used to tighten screws on the plane.



3. **Vise:** Used to hold pieces of wood while they are being shaped.



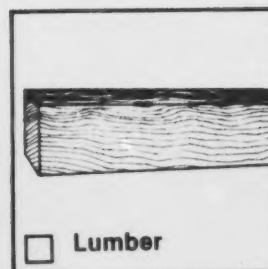
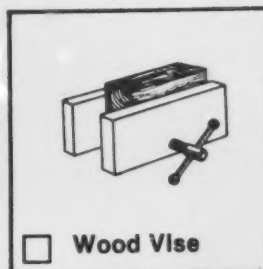
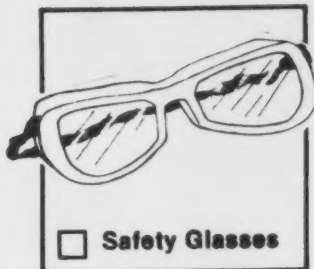
5. **Lumber:** Small piece for practice planing.



TURN TO NEXT PAGE

## B. Steps In Using a Hand Plane.

### 1. Find and Check Off the following:



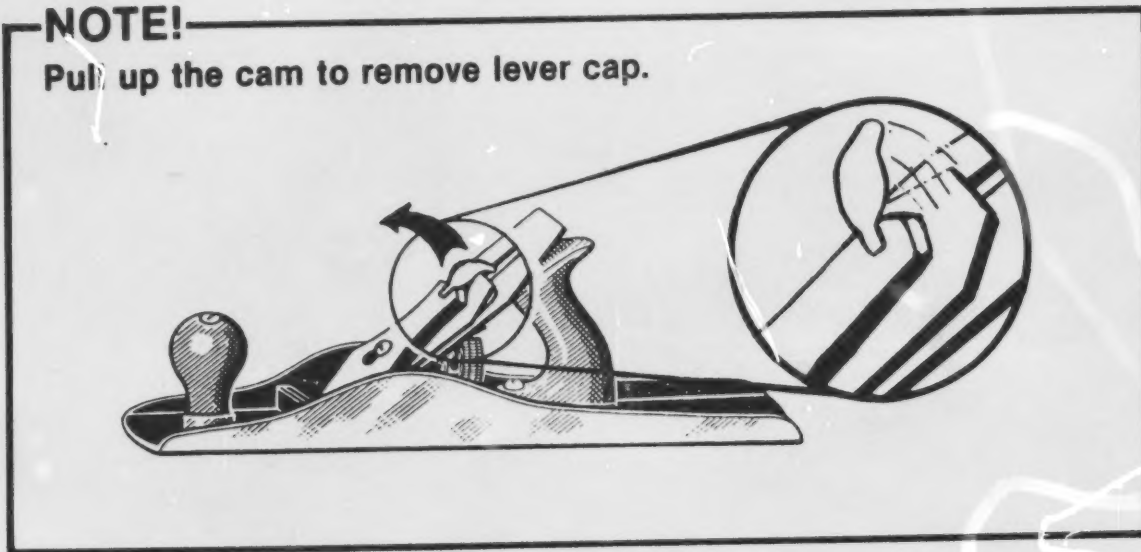
### 2. Wear proper safety equipment.



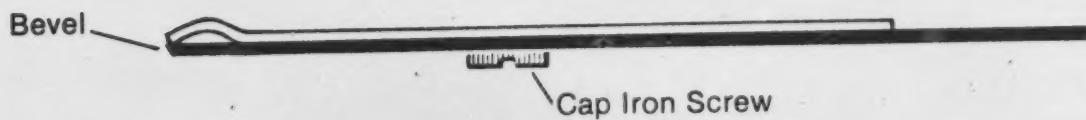
3. Remove lever cap on hand plane.

**NOTE!**

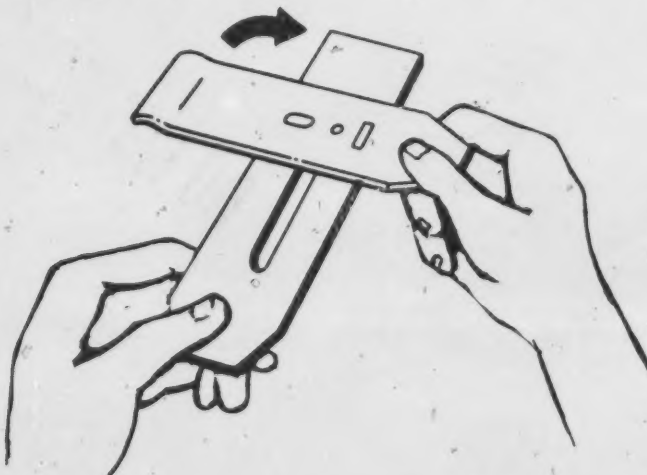
Pull up the cam to remove lever cap.



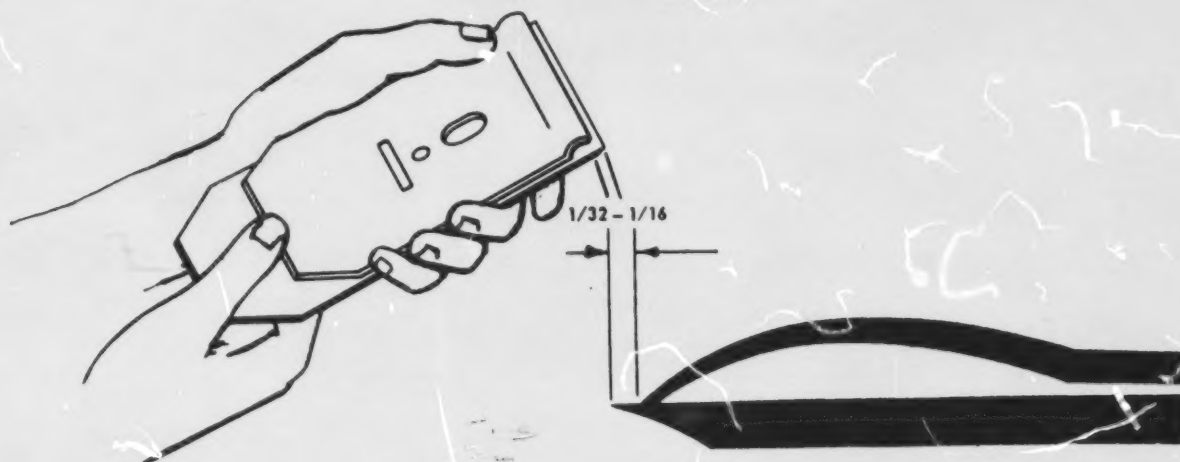
4. Remove the plane iron and iron cap.



5. Adjust plane iron cap by turning plane cap to the right. It will pass in back of cutting edge.

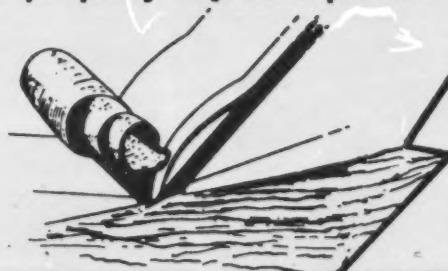


6. Slide plane iron cap to within  $1/16''$  to  $1/32''$  of blade edge, then tighten cap iron screw.

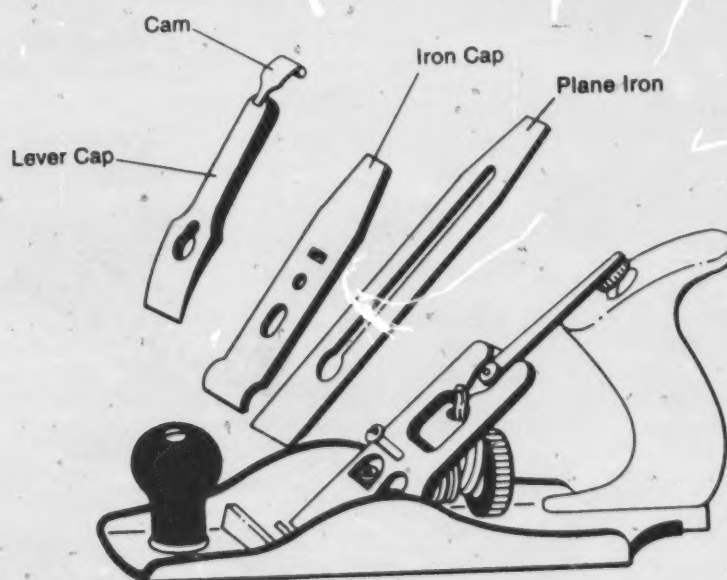


**NOTE!**

Drawing shows properly adjusted plane.



7. Reassemble plane iron and cap.



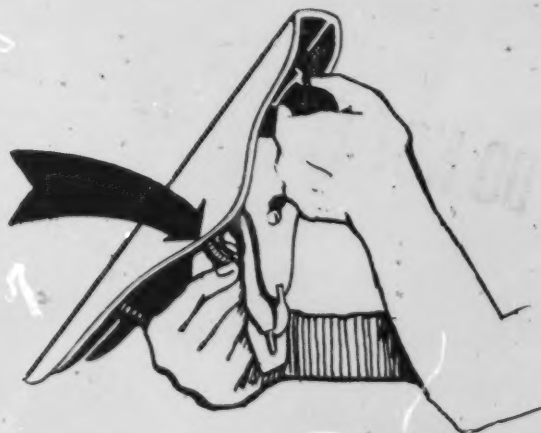
8. To adjust plane, turn plane upside down and hold knob in left hand.



9. Holding plane, look along the bottom edge.



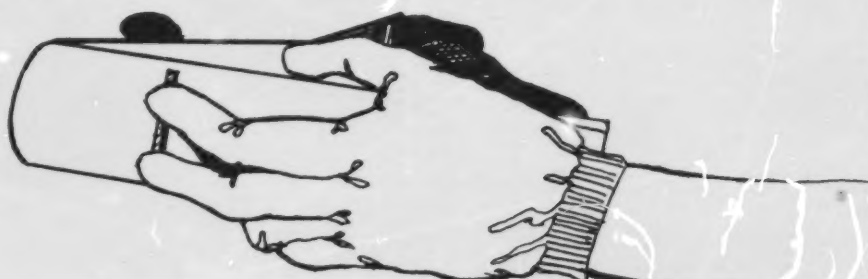
10. With right hand, turn adjusting nut until blade appears.





## **CAUTION!**

Blade setting may be checked by feeling with two fingers, but be careful!



11. Move lateral adjusting lever left or right. Blade should not be at an angle.

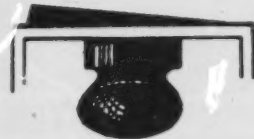


## **NOTE!**

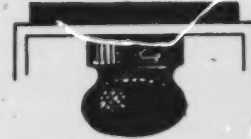
The plane iron should be straight.



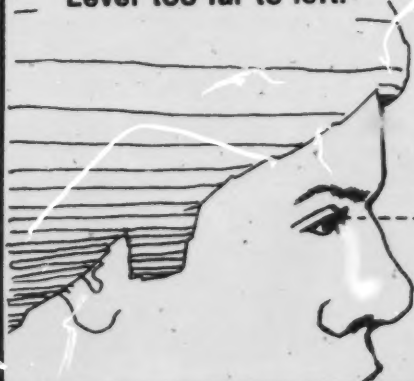
Lever too far to left.



Lever too far to right.

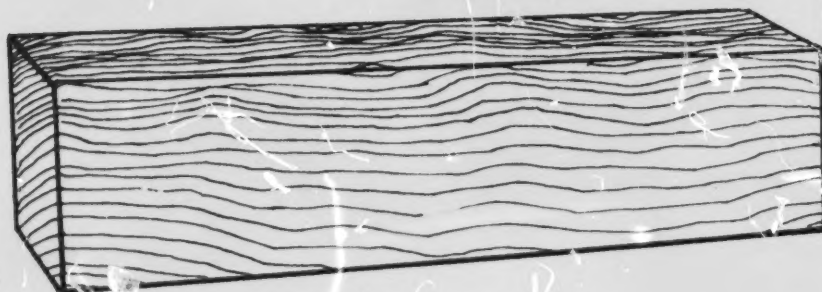


Blade too far out.

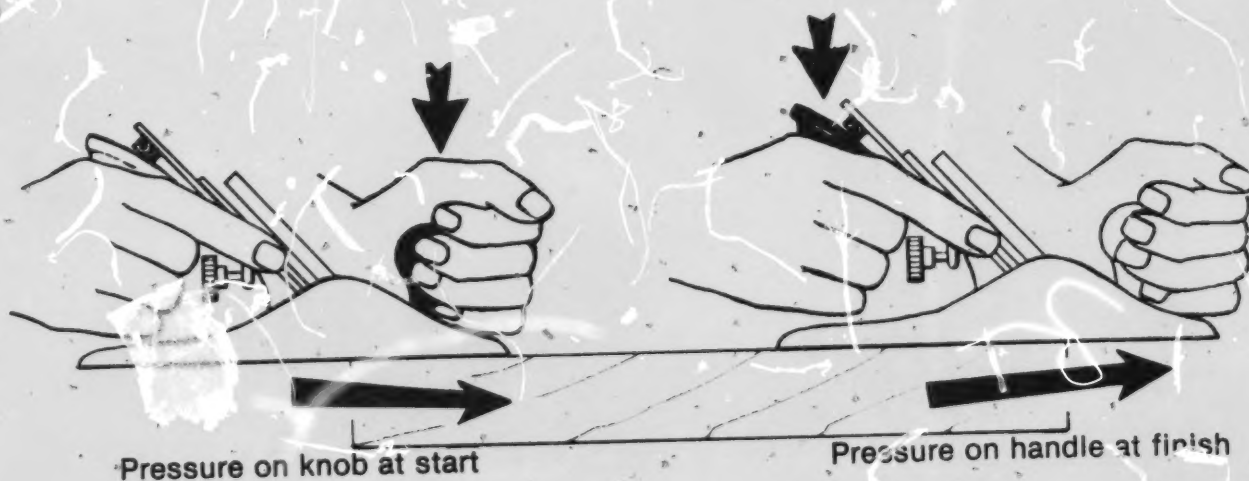


Adjust the blade evenly by sighting across it.

12. Secure a piece of lumber from your instructor. You are now ready to practice using the plane.



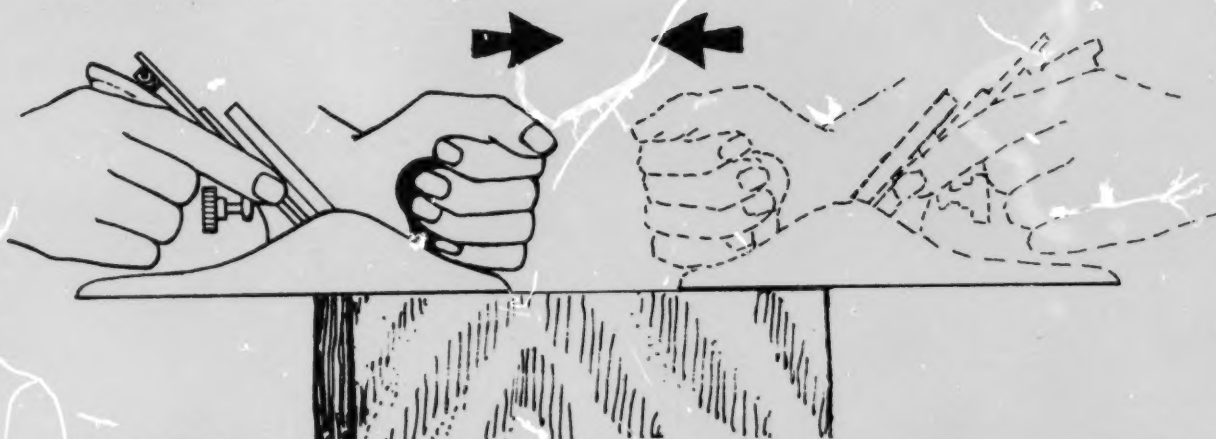
13. Start plane by applying pressure to the knob and handle and moving plane firmly and smoothly in a forward direction.



**NOTE!**

Start planing at highest point, holding the plane firm and level.  
Always plane with the grain.

14. Plane the end grain.



**NOTE!**

If you plane all the way across the end of a piece of wood, it will split.



15. Lay plane on its side when finished. This protects the cutting edge.



17. Clean your work area and return tools to their proper places.

**SEE YOUR INSTRUCTOR**

## Unit 8 Using a Hand Plane

### Tools and Materials Identification Exercise.

Student's Name: \_\_\_\_\_

Match each tool with its correct name.

\_\_\_\_\_ A. Lever Cap

\_\_\_\_\_ E. Plane Iron

\_\_\_\_\_ B. Cam

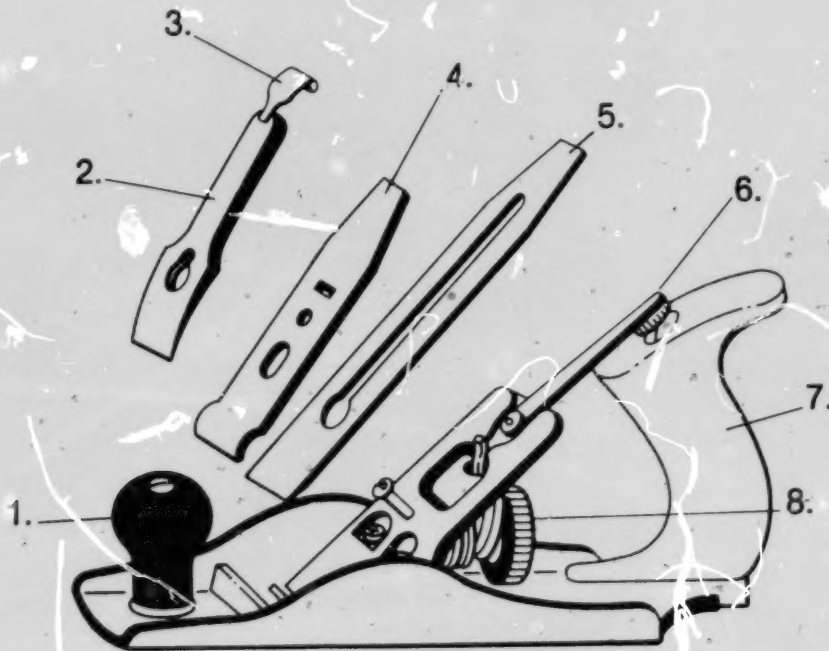
\_\_\_\_\_ F. Knob

\_\_\_\_\_ C. Iron Cap

\_\_\_\_\_ G. Lateral Adjusting Lever

\_\_\_\_\_ D. Adjusting Nut

\_\_\_\_\_ H. Handle



Unit 8  
Using a Hand Plane

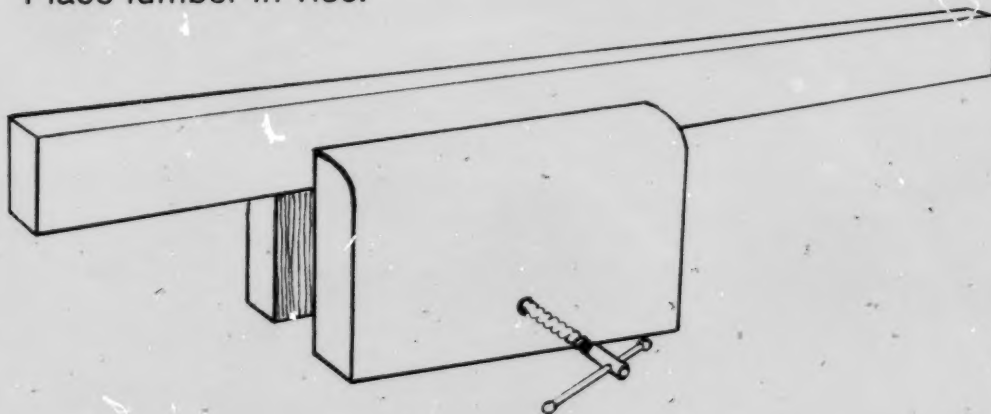
**Practical Exercise**

Student \_\_\_\_\_

1. Obtain from your instructor one 2"x 4"x 3' piece of lumber.



2. Place lumber in vise.



3. Draw a straight line 1/8" deep on both sides of the piece of lumber.

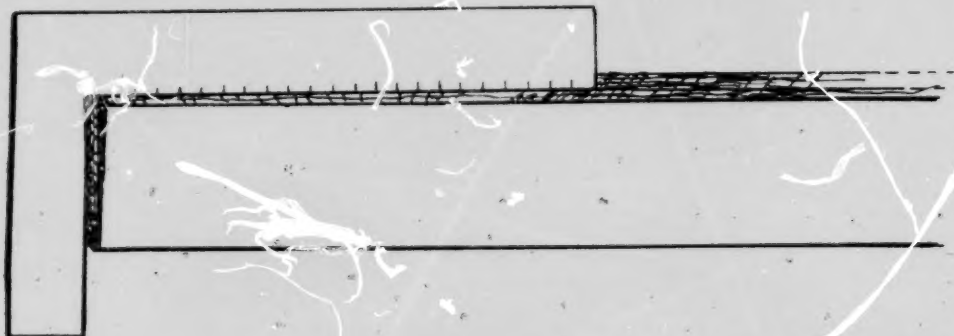




4. Plane down to your marks.



5. Check edges with carpenter's square for levelness.



**SEE YOUR INSTRUCTOR**

Vocational Preparation Curriculum  
**CARPENTRY**



**Unit 9**

**Using a Wood Chisel**

## Unit 9

### Using a Wood Chisel

#### Using a Wood Chisel

After you study this lesson, you should be able to:

1. Identify two types of wood chisels.
2. Demonstrate ability to use a wood chisel safely and according to recommended use.

#### Show What You Can Do.

Check the statement that fits you best.

1.

☐

I can do all the tasks above and want my instructor to give me the Practical Exercise.



**SEE YOUR INSTRUCTOR**

2.

☐

I want to study the information in this unit before I do the Practical Exercise.

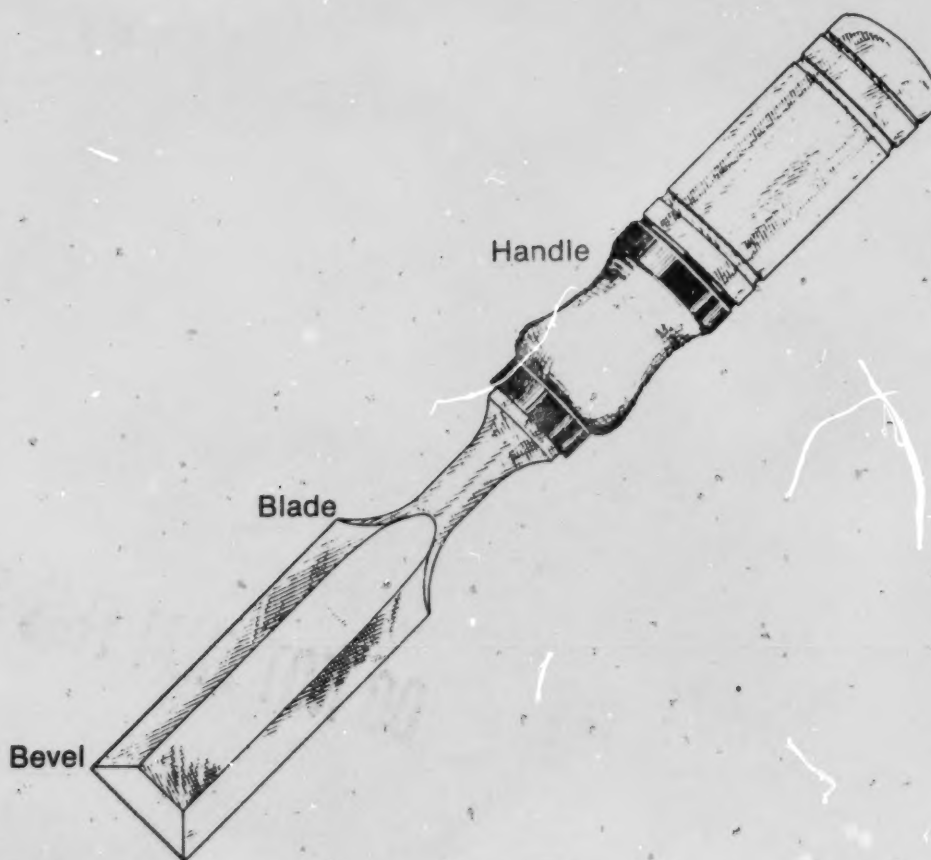


**TURN THE PAGE AND BEGIN**

## Unit 9 Using a Wood Chisel

### Introduction

Wood chisels are designed to make special kinds of cuts in wood. Wood chisels are available in widths ranging from 1/8" to 2". You will find many jobs in carpentry that require materials to be trimmed, beveled and shaped. When using a wood chisel always keep both hands back of the cutting edge.



**TURN TO NEXT PAGE**

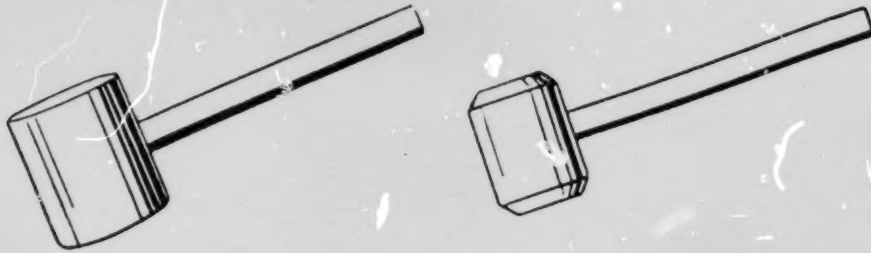
121

## Unit 9

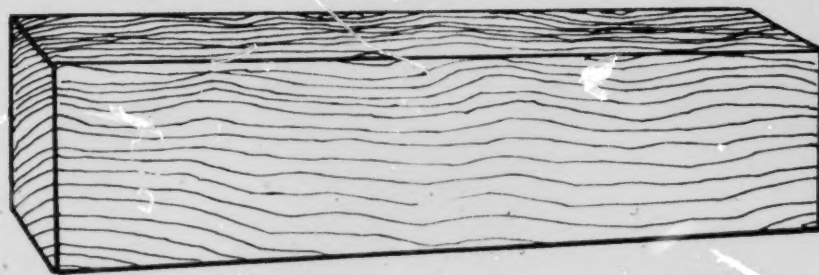
### Using a Wood Chisel

#### A. Tools, Materials and Equipment for Using a Wood Chisel.

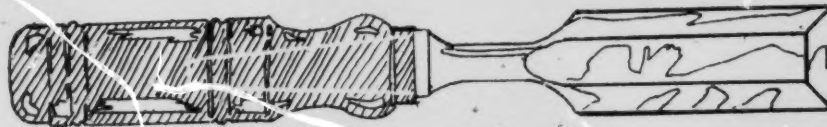
1. **Mallet:** Always used when striking a wood chisel.



2. **Lumber:** Used for practicing grooving and beveling.



3. **Tang Chisel:** Wood chisel which has a tang extending into the handle.



4. **Socket Chisel:** Wood chisel with handle fitted into a socket in the chisel metal.

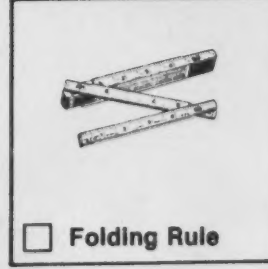
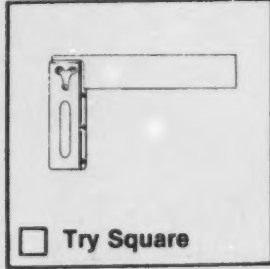
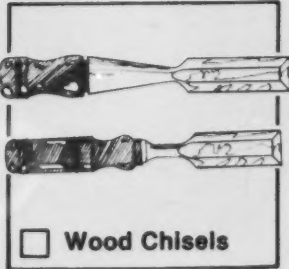
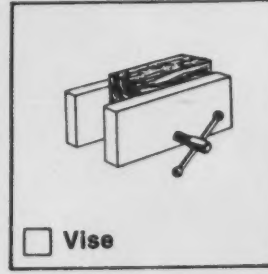




## Unit 9 Using a Wood Chisel

### B. Steps in Using a Wood Chisel.

1. Find and Check Off the following:



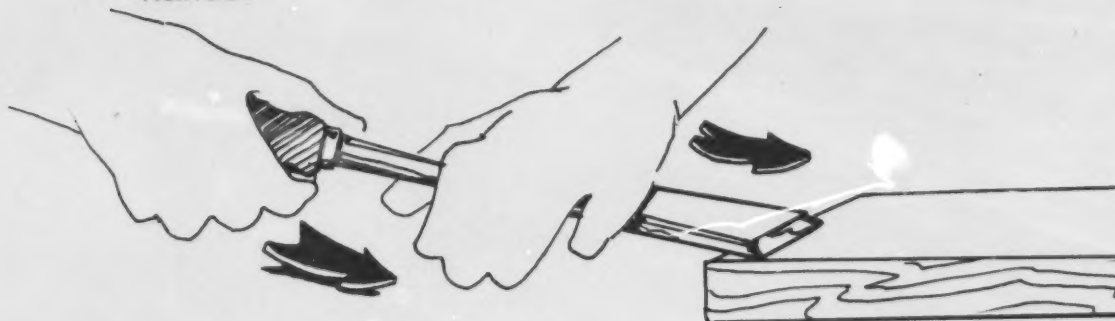
2. Wear proper safety equipment.



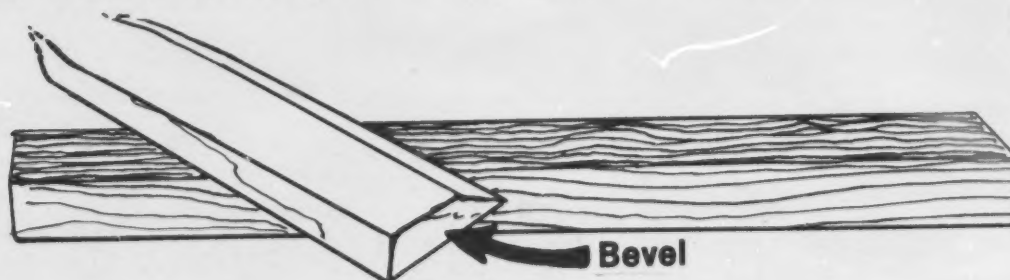
3. Secure a piece of lumber from your instructor and begin to practice using a wood chisel.



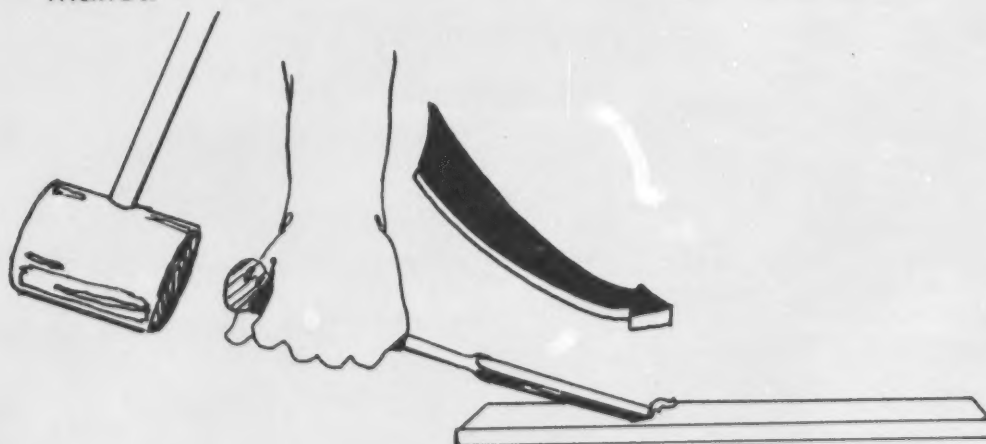
4. Use the tang chisel for light work by pushing chisel with the hands.



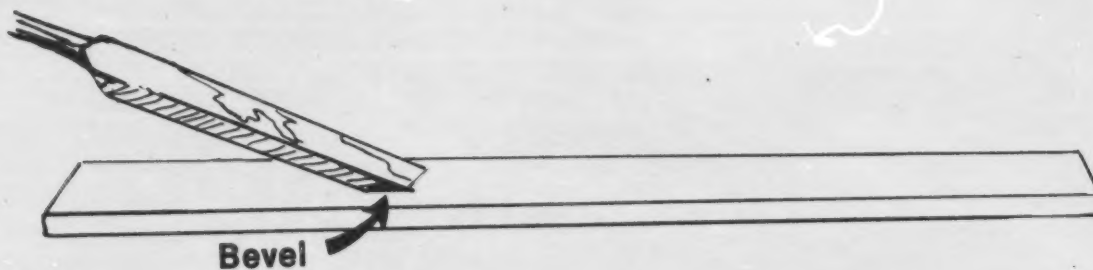
5. Have the bevel up for making lighter cuts.



6. Use the socket chisel for heavier cuts by striking it with a mallet.

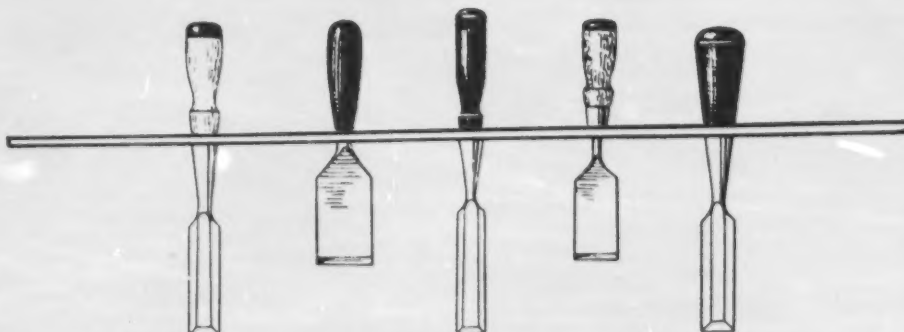


7. When doing heavier work, hold the bevel down.



**NOTE!**

Always protect the cutting edge of the wood chisel.



8. Clean your work area and return tools to their proper places.

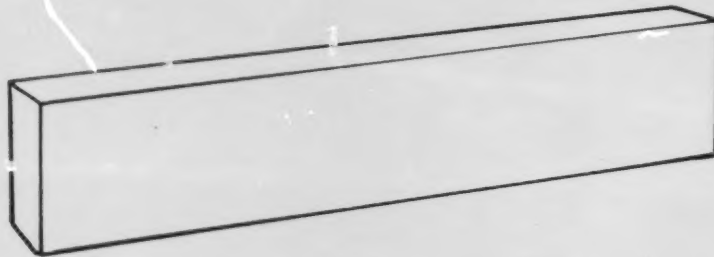
**SEE YOUR INSTRUCTOR**

## Unit 9 Using a Wood Chisel

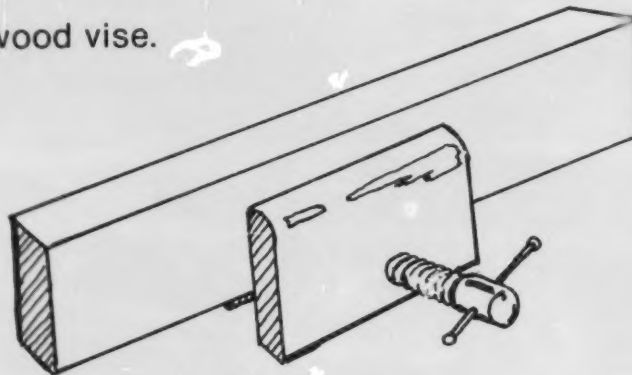
### Practical Exercise

Student: \_\_\_\_\_

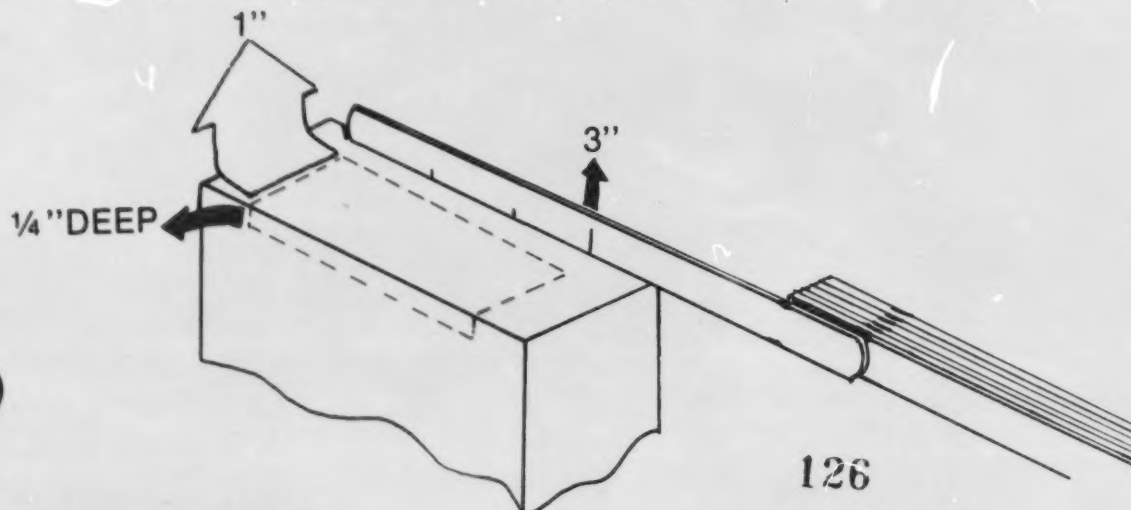
1. Obtain from your instructor one 2"x 4"x 10" lumber piece.



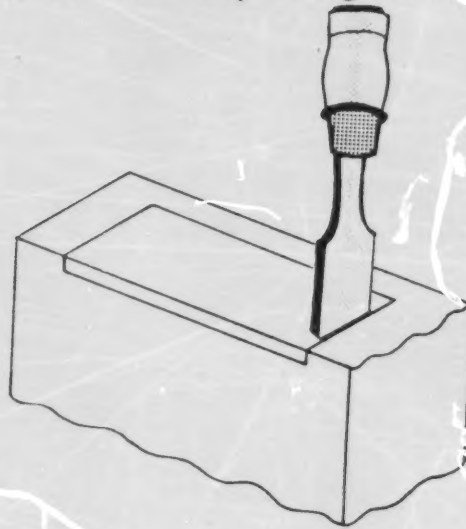
2. Place the lumber in a wood vise.



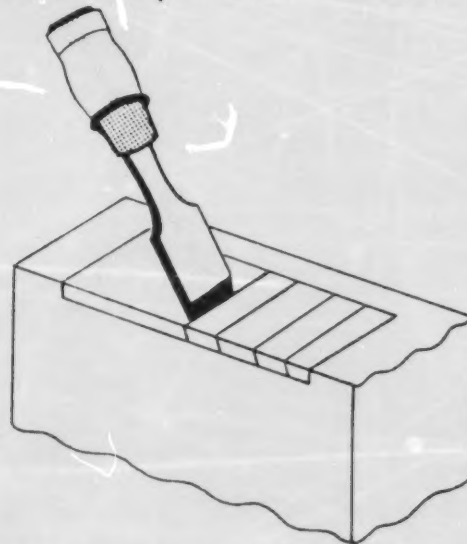
3. Using a folding rule, lay out the cut to be made.



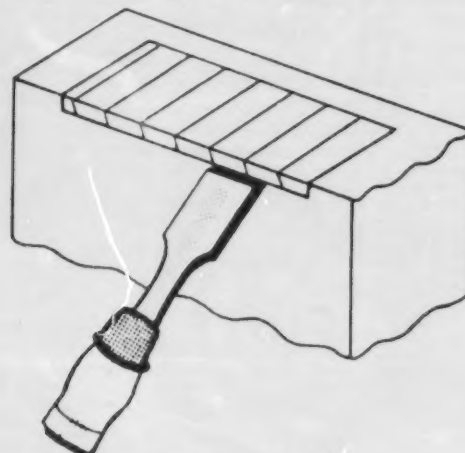
4. Use mallet and wood chisel to cut  $\frac{1}{4}$ " deep along lines



5. Use a try square to lay out lines of equal distance and cut each line  $\frac{1}{4}$ " deep.

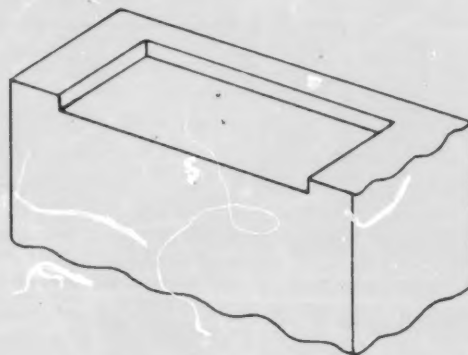


6. Finish removing the cut section and smooth cut.





7. Check your cut for squareness, smoothness and correct depth.



8. Show your work to your instructor.

